Vol. 935 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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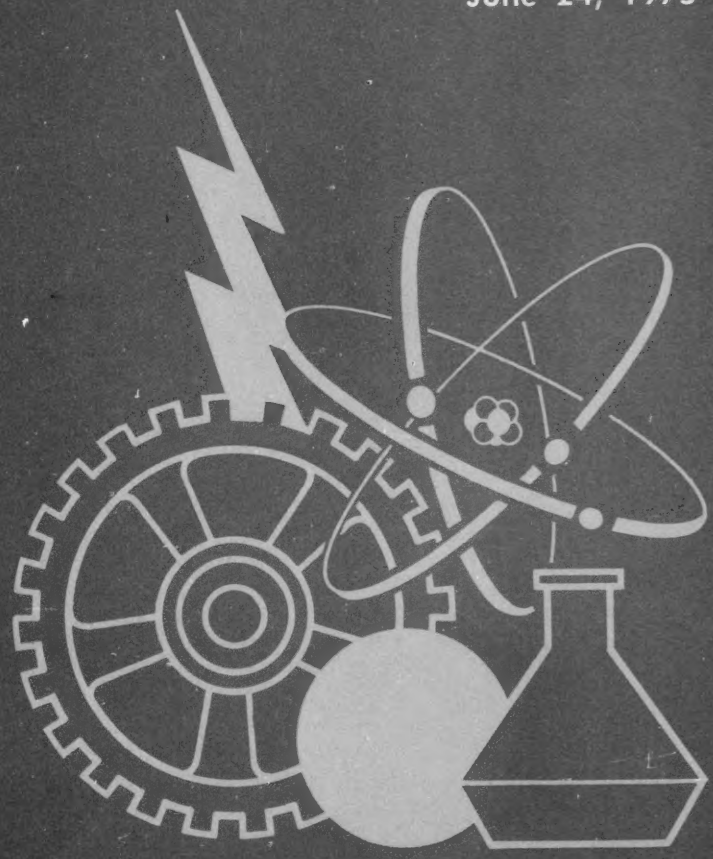
PATENTS

June 24, 1975



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 24, 1975 Volume 935 Number 4

CONTENTS

	Page
Patent and Trademark Notices	
Change of Address	1352
Patent Notices	
Certificates of Correction for the Week of June 24, 1975	1353
Disclaimer and Dedication	1353
Dedications	1353
Disclaimers	1353
Condition of Patent Applications	1355
Plant Patents Granted (3,733)	1356
Patents Granted	
General and Mechanical (3,890,646)	1357
Chemical (3,891,385)	1604
Electrical (3,891,789)	1712
Design Patents Granted (235,489)	1780
Index of Patentees	PI 1
Indices of Plants and Designs	PI 41
Classification of	
Patents (Including Reissues)	PI 43
Designs and Plants	PI 46
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 47
Designs and Plants	PI 49

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PATENT AND TRADEMARK OFFICE NOTICES

Change of Address

There recently has been an increased incidence in the number of applications suffering from disruptions in communications stemming from failure to notify the Patent and Trademark Office of a change of address on the part of applicant's representative (attorney or agent of record) in each application wherein he holds an active power of attorney. Applications have become abandoned as a result of an Office action being mailed to the old, uncorrected address and thereby failing to reach the representative at his new address sufficiently early to permit him to file a timely response. Accordingly, the requirement set out below is published as a reminder and is designed to ameliorate this problem.

Where an attorney or agent of record (or applicant, if he is prosecuting his application pro se) changes his correspondence address, he is responsible for promptly notifying the Patent and Trademark Office of his new correspondence address (including ZIP code number). A separate notification must be filed in *each application* for which he is intended to receive communications from the Office. The notification should also include his telephone number.

While the notification need take no particular form, it should be provided in a manner calling attention to the fact that a change of address is being made. Thus, the mere inclusion, in a paper being filed for another purpose, of an address different from the previously provided correspondence address, without mention of the fact that an address change is being made, would not ordinarily be recognized or deemed as instructions to change the address on the file record.

It is emphasized that the above-delineated responsibility is *additional* to the separate obligation (see 37 CFR 1.347) of a registered attorney or agent to notify the Attorney's Roster of any change of his address for entry on the register, which must be done in a letter separate from any notice of change of address filed in individual applications. That obligation continues without change.

The degree of care exercised in adhering to the foregoing requirement for notification of change of address in each concerned application will be a factor for consideration in deciding petitions filed under 37 CFR 1.137 to revive applications which have become abandoned because of a failure to timely receive an Office action addressed to the old address. In such instances, the showing of the cause of unavoidable delay must include an adequate showing that a timely notification of the change of address was filed in the concerned application, in a manner resonably calculated to call attention to the fact that it was a change of address. If no such notification was made, or was made belatedly, the showing must include an adequate explanation of that failure or delay. A showing that notification was made on a paper filed in the Patent and Trademark Office listing *plural* applications as being affected will not be considered a proper notification.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

May 28, 1975.

Certificates of Correction for the Week of June 24, 1975

Re. 28,296	3,840,738	3,860,051	3,869,269
3,620,650	3,841,393	3,860,208	3,869,447
3,661,611	3,843,084	3,860,635	3,869,530
3,665,021	3,843,638	3,860,871	3,869,984
3,731,868	3,844,028	3,861,048	3,870,082
3,747,696	3,844,226	3,861,096	3,870,120
3,759,978	3,844,846	3,861,218	3,870,728
3,761,238	3,844,962	3,861,244	3,870,808
3,770,164	3,845,215	3,861,933	3,871,343
3,770,788	3,846,119	3,862,005	3,871,732
3,771,531	3,846,376	3,862,193	3,871,854
3,782,530	3,846,412	3,862,493	3,872,019
3,785,159	3,846,484	3,862,533	3,872,205
3,785,749	3,846,623	3,862,974	3,872,235
3,786,058	3,847,720	3,863,185	3,872,307
3,786,405	3,847,746	3,863,353	3,872,423
3,788,375	3,847,901	3,863,535	3,872,480
3,788,622	3,848,197	3,864,329	3,872,761
3,793,257	3,848,647	3,864,574	3,872,773
3,795,683	3,848,801	3,864,672	3,872,995
3,803,439	3,848,876	3,864,758	3,873,352
3,804,820	3,850,631	3,864,927	3,873,383
3,808,543	3,850,845	3,865,265	3,873,668
3,812,497	3,850,891	3,865,329	3,873,814
3,819,810	3,850,905	3,865,417	3,874,509
3,821,016	3,851,296	3,865,700	3,874,682
3,822,279	3,851,363	3,865,757	3,874,797
3,822,827	3,852,282	3,865,764	3,874,927
3,825,583	3,852,458	3,865,784	3,874,932
3,826,031	3,852,795	3,866,160	3,874,942
3,828,203	3,853,516	3,867,088	3,875,164
3,829,452	3,853,966	3,867,386	3,875,503
3,831,550	3,856,812	3,867,409	3,875,573
3,831,952	3,856,815	3,867,468	3,875,900
3,834,414	3,857,170	3,867,764	3,876,355
3,835,062	3,857,807	3,867,884	3,876,532
3,838,121	3,857,949	3,867,999	3,877,325
3,838,141	3,858,362	3,868,263	3,877,518
3,838,550	3,858,510	3,868,334	3,877,680
3,838,958	3,859,037	3,868,336	3,877,718
3,839,065	3,859,162	3,868,868	3,878,591
3,839,415	3,859,691	3,869,170	3,878,787
			3,879,382

Disclaimer and Dedication

3,504,154.—*Victor H. Marcolini,* Cicero, Ill. EDM POWER SUPPLY WITH SEPARATE SOURCES OF GAP IONIZING POTENTIAL AND MATERIAL ERODING ENERGY. Patent dated Mar. 31, 1970. Disclaimer and dedication filed Sept. 14, 1974, by the assignee. *Amsted Industries Incorporated.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Dedications

3,794,431.—*Larry R. Rothrock,* Poway, Calif. METHOD AND APPARATUS FOR STANDARDIZING OPTICALLY PUMPED LASER MATERIALS. Patent dated Feb. 26, 1974. Dedication filed Nov. 14, 1974, by the assignee, *Union Carbide Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,817,128.—*James P. Evans,* Oklahoma City, Okla. RAPIDLY ADJUSTABLE WRENCH. Patent dated June 18, 1974. Dedication filed June 24, 1974, by in the inventor.

Hereby dedicates to the Public the remaining term of said patent.

3,858,677.—*Robert J. Bussey,* Alamo, Calif. RETORT MUFFLER. Patent dated Jan. 7, 1975. Dedication filed Feb. 10, 1975, by the assignee, *The Clorox Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,863,325.—*Thomas B. Gurganus,* Avon, and *Leland L. Grubb,* Parma, Ohio. GLASS CLOTH IN METAL FORGING. Patent dated Feb. 4, 1975. Dedication filed Mar. 10, 1975, by the assignee, *Aluminum Company of America.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,520,417.—*Larry L. Durr* and *Edward D. Fulton,* Lebanon, Ind. PLEATED PAPER FILTER AND METHOD OF MAKING SAME. Patent dated July 14, 1970. Disclaimer filed Apr. 18, 1975, by the assignee, *The Carborundum Company.*

Hereby disclaims the entire remaining term of said patent.

3,566,685.—*Carl W. Zimmerman* and *George V. Copland,* Duncan, Okla. FLUID FLOW METERING METHOD AND SYSTEM. Patent dated Mar. 2, 1971. Disclaimer filed Nov. 1, 1974, by the assignee, *Halliburton Company.*

Hereby enters this disclaimer to claims 8, 9, 28 and 29 of said patent.

3,571,609.—*Louis I. Knudson,* Norwich, N.Y. IGNITION APPARATUS SELECTIVELY OPERABLE AT DIFFERENT LEVELS OF DISCHARGE ENERGY. Patent dated Mar. 23, 1971. Disclaimer filed Nov. 6, 1974, by the assignee, *General Laboratory Associated, Inc.*

Hereby enters this disclaimer to claims 9 and 10 of said patent.

3,575,169.—*Joseph A. Voss,* Denver, Colo., and *Carl W. Johnson,* Neenah, Wis. HYGIENIC MEDIUM APPLICATOR. Patent dated Apr. 20, 1971. Disclaimer filed July 17, 1974, by the assignee, *Kimberly-Clark Corporation.*

Hereby enters this disclaimer to claims 1–5 of said patent.

3,591,962.—*Joseph A. Connell,* Harbor City, Calif. CRYOGENIC POWER SOURCE FOR STARTING JET ENGINES. Patent dated July 6, 1971. Disclaimer filed Nov. 26, 1973, by the assignee, *NRG Incorporated.*

Hereby enters this disclaimer to claim 4 of said patent.

3,724,945.—*Felix R. Masiello,* Parsippany, N.J. SHEET FEEDING AND CUTTING DEVICE. Patent dated Apr. 3, 1973. Disclaimer filed Jan. 30, 1975, by the assignee, *Addressograph-Multigraph Corporation.*

Hereby enters this disclaimer to claim 9 of said patent.

3,764,948.—*Emil Robert Plasko,* Dayton, Ohio. THERMAL LIMITER FOR ONE OR MORE ELECTRICAL CIRCUITS AND METHOD OF MAKING THE SAME. Patent dated Oct. 9, 1973. Disclaimer filed Apr. 4, 1975, by the assignee, *Micro Devices Corp.*

Hereby enters this disclaimer to claims 1 through 5, and 11 through 15 of said patent.

3,816,802.—*Roy I. Crask,* Edina, and *William D. Egerer,* Minneapolis, Minn. LIGHTING ARRESTER. Patent dated June 11, 1974. Disclaimer filed Mar. 28, 1975, by the assignee, *Buckbee Mears Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5 and 6 of said patent.

3,819,060.—*Giles A. Kendall,* Burbank, Calif., and *William D. Wallace,* Chicago, Ill. DAMPING APPARATUS. Patent dated June 25, 1974. Disclaimer filed May 2, 1975, by the assignee, *Menasco Manufacturing Co.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,828,032.—*Richard S. Henion*, Brockport, and *Cataldo A. Maggiulli*, Pittsford, N.Y. PROCESS FOR PREPARING 3-ALKYL-2-BENZOTHIAZOLINYLIDENE KETONES. Patent dated Aug. 6, 1974. Disclaimer filed Mar. 31, 1975, by the assignee, *Eastman Kodak Company*.

Hereby enters this disclaimer to claims 1 to 9, inclusive, of said patent.

3,829,385.—*Charles Theodoric Abbott, Jr.* and *George Cunningham Smith, Jr.* Montgomery, Ohio. DETERGENT COMPOSITIONS CONTAINING N-CHLOROIMIDES. Patent dated Aug. 13, 1974. Disclaimer filed Sept. 12, 1974, by the assignee, *The Procter & Gamble Company*.

Hereby disclaims the term of this patent subsequent to June 18, 1991.

3,831,892.—*David M. Herman*, Bonanza, Oreg. JACK LOCK. Patent dated Aug. 27, 1974. Disclaimer filed Nov. 11, 1974, by the inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,838,097.—*Joseph G. Wirth* and *Darrell R. Heath*, Schenectady, N.Y. PROCESS FOR MAKING POLYETHERIMIDES AND PRODUCTS DERIVED THEREFROM. Patent dated Sept. 24, 1974. Disclaimer filed Nov. 1, 1974, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claims 30–39 of said patent.

3,838,787.—*Harry J. McCloskey*, Philadelphia, Pa. SCORED AND SEAM WELDED CAN. Patent dated Oct. 1, 1974. Disclaimer filed Nov. 6, 1974, by the assignee, *Ellisco Incorporated*.

Hereby enters this disclaimer to claims 1, 2, 3, 4 and 7 of said patent.

3,846,715.—*J. Michael Yarborough*, Santa Clara, Calif. MULTIPLE DYE STREAM LASER. Patent dated Nov. 5, 1974. Disclaimer filed Mar. 26, 1975, by the assignee, *Coherent Radiation*.

Hereby enters this disclaimer to claim 7 of said patent.

3,854,258.—*Joseph J. Colado*, Addison, and *Norman G. Turner*, Lake Bluff, Ill. ARTICULATED HOLD-DOWN ANCHOR DEVICE FOR THE EMBEDDED CABLES OF A PRESTRESSED CONCRETE GIRDER. Patent dated Dec. 17, 1974. Disclaimer filed Mar. 21, 1975, by the assignee, *Superior Concrete Accessories, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,863,653.—*Georges Boudouris*, Grenoble, and *Gregoire Kalopissis*, *Jean-Luc Levesque*, and *Paul Roussopoulos*, Paris, France. METHOD FOR TREATING FIBERS BY SUBJECTING THEM TO HIGH FREQUENCY ELECTRIC FIELDS. Patent dated Feb. 4, 1975. Disclaimer filed Apr. 15, 1975, by the assignee, *Societe Anonyme dite: L'Oreal*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 24, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-26-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-23-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-24-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-6-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-28-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-2-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning: Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-29-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-15-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-3-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-9-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-29-74

Expiration of patents: The patents within the range of numbers indicated below expire during June 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,836,826, to 2,840,820 inclusive
Plant Patents..... Numbers 1,714, to 1,721 inclusive

PLANT PATENTS

GRANTED JUNE 24, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,733
NECTARINE TREE

David L. Armstrong, Orange, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Feb. 7, 1974, Ser. No. 440,480

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—40 **1 Claim**

1. A new variety of asexually reproduced nectarine tree, substantially as herein illustrated and described, said tree being characterized in particular by its tendency to produce fruit which ripens in mid-June in a growing region such as Wasco, Calif., in which locale the chilling requirement is comparble to that of the Springtime peach, the said fruit, when mature, being about three inches in axial diameter, of the freestone type, white fleshed, juicy, aromatic, and full-flavored; the fruit of said new variety being further characterized by excellent storing and shipping characteristics.

3,734
AVOCADO TREE

Harold E. Kendall, P.O. Box 458, Goulds, Fla. 33170

Filed Feb. 13, 1974, Ser. No. 442,052

Int. Cl. A01h *5/03*

U.S. Cl. Plt—44 **1 Claim**

1. A new and distinct variety of avocado tree, substantially as shown and described.

3,735
POINSETTIA PLANT

Paul Ecke, Jr., Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Apr. 22, 1974, Ser. No. 462,995

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very vigorous, tough, durable and tall plant habit, with the ability to grow well as a multiple stem and multiple bloom plant, a very vigorous and extensive root system, stiff stems which do not require staking, retention of the bracts, foliage and inflorescenses for a long period of time after reaching maturity, a habit of not requiring light to delay bud set, a well-pinching habit which produces 3 or more breaks, a normal blooming habit at about 2° lower night temperatures than required for variety "C–1 Pink" (Plant Pat. No. 3,120) during the months of October, November and December, but having the ability to be satisfactorily brought into bloom and full maturity in every month of the year through the exercise of proper greenhouse cultural techniques, a distinctive and attractive appearance of the bracts and their absence of any tendency to droop with age, a distinctive and attractive Hot Pink general color tonality of the bracts, absence of drooping and retention of the position of the inflorescences relative to the bracts without rising as occurs in other varieties as their inflorescenses approach maturity, and excellent keeping qualities and consequent suitability for home decoration.

PATENTS

GRANTED JUNE 24, 1975

ERRATA

For CLASS	See PATENT NO.
228–173	3,890,696
061–030	3,890,802
075–000.5 BA	3,890,816
137–625.6	3,891,145
138–094.3	3,891,146
357–041	3,891,190
281–029	3,891,240
280–047.13 R	3,891,245
073–204	3,891,391
204–016	3,891,542
423–465	3,891,690
260–889	3,891,816

PATENTS

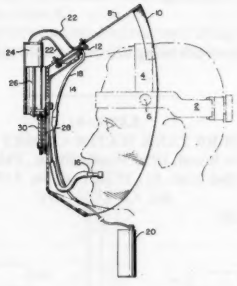
GRANTED JUNE 24, 1975

GENERAL AND MECHANICAL

3,890,646
WELDING HOOD

Donald G. Fassett, Route 3 Box 670, Olympia, Wash. 98506, and Ralph F. Thompson, 9242 S. "G" St., Tacoma, Wash. 98444

Filed Oct. 19, 1973, Ser. No. 408,066
Int. Cl. F16p *1/06;* **A61f** *9/00*
U.S. Cl. 2—8 **7 Claims**



1. In a welding helmet including a face shield having an opening, and a window reciprocatively mounted on the face shield to be moved to and from a viewing position in registry with the opening, the improvement comprising:

actuator means responsive to the breath of the wearer for moving the window to and from its viewing position;

means connecting said actuator means with the window;

said connecting means including a threaded shaft having a longitudinal axis, said shaft being rotatively movable by said actuator means about its longitudinal axis, nut means secured to the window and yieldingly threadedly engaged with the shaft to be moved along the shaft in response to rotation of said shaft about its longitudinal axis, so as to thereby correspondingly move the window to and from its viewing position;

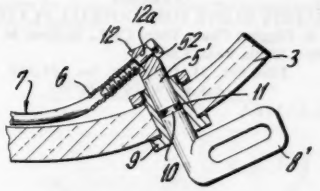
said nut means comprising a plurality of mutually opposed nut sections threadedly engaging said shaft, and means for biasing said nut sections relatively toward each other so as to yieldingly grip said shaft therebetween, said biasing means being adapted to allow said nut sections to be forced out of engagement with said shaft in response to continued rotation of said shaft about its longitudinal axis when movement of the window is stopped.

3,890,647
WINDOW SHIELD FOR RESPIRATORY MASK AND PROTECTIVE HELMUTS

Ernst Warncke, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Jan. 18, 1974, Ser. No. 434,435
Claims priority, application Germany, Feb. 1, 1973, 2304866
Int. Cl.² A61F *9/04*
U.S. Cl. 2—9 **11 Claims**

1. A face mask construction, particularly an oxygen mask or similar respiratory mask or protective helmet, comprising a mask body having a large window area thereon with a curved viewing window of a transparent material having a curvature extending over substantially its whole viewing area, a pivot bushing extending through said mask adjacent each side of said window, a pivot member rotatably supported in each of said bushings and having an exterior handle end and an interior inwardly extending end, a wiper body extending between said pivot members and connected to the interior ends thereof, said wiper body being of resilient material and being

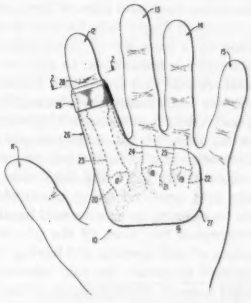


held by said interior end in a position to bear resiliently against the interior surface of said window, said pivot members being rotatable to move said wiper body through a path between the opposite edges thereof.

3,890,648
PROTECTIVE DEVICE FOR USE BY PLAYER OF A HARDBALL GAME, PARTICULARLY BASEBALL

Robert Eugene Beal, 1305 Veerman, Pekin, Ill. 61554

Filed Sept. 11, 1974, Ser. No. 505,096
Int. Cl.² A41D *13/00;* **A47J** *45/10*
U.S. Cl. 2—20 **10 Claims**



1. A protective device for a hand adapted to be worn on the hand between the palm side of the hand and a conventional glove used in hardball games such as baseball, comprising

a first body portion of elongated shape adapted to overlie a part of the first finger on the palm side of the hand adjacent the palm of the hand,

a second body portion of generally rectangular shape adapted to overlie at least the part of the palm of the hand which overlies the knuckle joint of the first finger, the knuckle joint of another finger and parts of the carpal and metacarpal bones adjacent such knuckle joints,

the first body portion and the second body portion being of unitary construction and including impact absorbing material,

and attaching means for attaching the first body portion to the first finger of the hand to support the first body portion in overlying relation with said part of the first finger, the relative unitary relation between the first body portion and the second body portion being such that when the first body portion overlies said part of the first finger

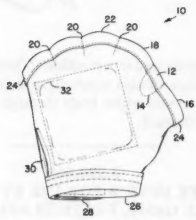
the second body portion overlies at least said part of the palm of the hand which overlies the knuckle joint of the first finger, the knuckle joint of another finger and the carpal and metacarpal bones adjacent such knuckle joints.

3,890,649

SAFETY GLOVE FOR FOOTBALL PLAYERS

Dennis R, Diggins, Chula Vista, Calif., assignor to Daniel M. Ramirez, Chula Vista, Calif.

Filed Feb. 21, 1974, Ser. No. 444,319
Int. Cl. A11d *19/00*
U.S. Cl. 2—161 A **1 Claim**



1. A protective glove for the hand of a football player comprising a body portion made of a flexible tear-resistant fabric and covering the palm, back and sides of the hand, a plurality of contiguous, truncated finger stalls formed along one end of said body portion by a plurality of lineal stitchings, spaced along and substantially perpendicular to said one end, a truncated thumb stall on said one end which is spaced from the index finger stall by a web of said fabric formed by a U-shaped stitching along said one end, a strengthening strip sewed along said one end on the palm, back and sides of said body portion to completely encompass said finger and thumb stalls along said end, the edges of the palm and back side of said body protion opposite said one end being unconnected to each other to provide an opening to receive said hand in said body portion and encompass the wrist of the player, a strap attached to the edges of said opening and having locking means on each end thereof to secure the said opening around the wrist and a pocket formed on the interior surface of the back side of said body portion to removably receive a protective pad therein.

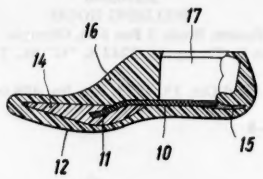
3,890,650

ARTIFICIAL FOOT FOR LEG PROSTHESES

Jan Prahl, Luneburg, Germany, assignor to Ipos Gesellschaft fur Integrierte Prothesenentwicklung und Orthopadietechnischen Service m.b.H. & Co. K.G., Germany

Filed Aug. 2, 1974, Ser. No. 494,277
Claims priority, application Germany, Aug. 18, 1973, 2341887
Int. Cl. A61f *1/08*
U.S. Cl. 3—7 **4 Claims**

1. An artificial foot made of foamed synthetic materials that are foamed within a mold, for leg prostheses, characterized by a metallic base plate disposed in the area of the sole of the foot within the foamed foot member, a forwardly extending portion of said metallic base plate defining a downwardly depending offset portion, the configuration of said offset portion of said base plate adapted to the roll-off motion of the ball of the foot, said offset portion secured to a forefoot core made of a homogeneous plastic material, the configuration of said forefoot core corresponding to the shape of the point of the foot, and a rearwardly extending portion of said metallic base plate supported by a portion of a tab made of a homogeneous plastic material, said tab being disposed within the heel portion of the foot.

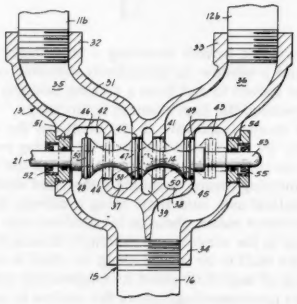


3,890,651

PRESSURE TANK WATER CLOSET SYSTEM

Robert Arnold Wood, 1970 Woodcliff Ln., Palatine, Ill. 60067

Filed Mar. 11, 1974, Ser. No. 449,752
Int. Cl. E03d *3/10*
U.S. Cl. 4—26 **12 Claims**



1. A water closet flushing apparatus which comprises a pair of elongated upright tanks of small cross sectional area adapted to fit in the wall space of a building, each tank having sealed top ends capable of trapping air and open bottoms for receiving and discharging water, a spool valve having a housing receiving the bottoms of the tanks in sealed relation, a valve spool slidably mounted in said housing, a water inlet to said housing, a water outlet from said housing, a valve spool slidable in the housing from first position feeding water from the inlet to one tank and discharging water from the other tank to the outlet to a second position discharging water from the one tank to the outlet and feeding water from the inlet to said other tank.

3,890,652

FLUSH WATER VALVE ASSEMBLY

Howard A. Fulton, Big Prairie, Ohio, assignor to Mansfield Sanitary, Inc., Perrysville, Ohio

Filed Aug. 15, 1973, Ser. No. 388,389
Int. Cl. E03d *1/34*
U.S. Cl. 4—58 **5 Claims**

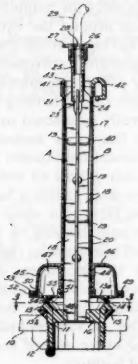
1. A flush water valve assembly of the class described comprising:

a. a flush water valve seat means having an integral radial spider in axial alignment therewith fixedly mounted in the flush water outlet passage of the bottom wall of a water reservoir tank and an upstanding vertical valve guide blade means fixedly mounted on said spider in axial alignment therewith,

b. a cylindrical movable flush valve means having an upstanding cylindrical tubular element extending above the water level in the reservoir prior to the flush release and slidably mounted on said valve guide blade means and in frictional engagement therewith, a ring float chamber having a flat bottom surface mounted on the lower end of said tubular element and an elastomeric flush valve means removably mounted over the bottom surface of said ring float means in water seal alignment with said valve seat means and having a valve opening hook means adjacent to the top of said tubular element,

c. said guide blade means having integral guide blades spaced apart and extending upwardly from said spider to just below the top of said tubular element prior to the flush release thereof,

d. said guide blades having like recesses along the adjacent inner top edges thereof extending downwardly and having



shoulders therein adjacent their midpoint and forming an axially aligned opening therein,

e. a water replenishing after flush trap seal refill tube fixedly mounted in said opening adjacent said shoulders and extending above the tops of said tubular element and guide blade means,

f. a nippled cap ring valve control means removably mounted on the upper end of said water refill tube and having a substantially flat upper surface and an integral nipple on its lower surface, the said cap ring having an outside ring diameter of at least equal to the outside diameter of said tubular element thereby limiting the upward movement thereof when the valve is open and a nipple and ring inside diameter sufficient for mounting on said refill tube and to receive an after flush water supply refill tube for replenishing the water supply in the trap of the plumbing fixture.

3,890,653

INCINERATOR TOILET HAVING A VERTICALLY MOVABLE INCINERATOR CHAMBER LID

Ernest Bayne Blankenship, Irving, Tex., assignor to Research Products/Incinolet Corporation, Dallas, Tex.

Filed Nov. 6, 1970, Ser. No. 87,413The portion of the term of this patent subsequent to June 24, 1991, has been disclaimed.
Int. Cl. A47k *11/02*
U.S. Cl. 4—131 **18 Claims**

1. An incinerator toilet comprising:

an incinerator chamber having an open upper end,

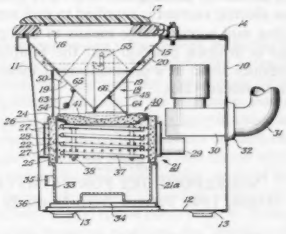
a recessed seat located below the top of said upper end of said chamber and extending around the opening of said upper end,

a lid for opening and closing said upper end of said chamber,

said lid having a seat adapted to fit into and engage said recessed seat to close said upper end of said chamber,

a bowl disposed above said chamber and including an upper bowl portion and a lower bowl portion,

said lower bowl portion comprising hinged sections adapted to move inward together and to move outward away from each other for closing and opening the bottom end of said lower bowl portion,



means for initially raising said lid out of said recessed seat and then moving said lid laterally of said upper end of said incinerator chamber to open said upper end,

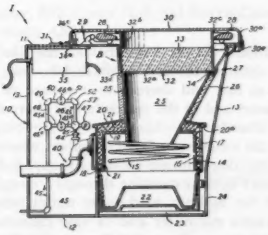
said hinged sections being allowed to move outward away from each other to open the bottom portion of said lower bowl portion when said lid is moved laterally of said upper end of said chamber to its open position to allow substance in said bowl to pass into said incinerator chamber.

3,890,654

INCINERATOR TOILET VENTED BY AIR EJECTOR

Ernest Bayne Blankenship, Dallas, Tex., assignor to Research Products/Incinolet Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 148,456, June 1, 1971. This application July 27, 1973, Ser. No. 383,164
Int. Cl. A47k *11/02*
U.S. Cl. 4—131 **27 Claims**



1. An incinerator toilet comprising:

housing means including an incinerator chamber and having an opening for receiving substances therethrough,

a cover movable to open and closed positions for opening and closing said opening of said housing means,

means for heating the interior of said incinerator chamber,

an exhaust line connected with and extending outwardly from said incinerator chamber,

an air inlet means having its discharge end within said exhaust line and directed downstream thereof,

a pressure line for supplying air under pressure to said air inlet means,

said pressure line having an inlet end connectable to a source of air under pressure,

first electrically operable valve means of a first predetermined orifice for controlling flow of air from said pressure line to said air inlet means,

a second electrically operable valve means of a second predetermined larger orifice predetermined location, controlling flow of air from said pressure line to said air inlet means, and

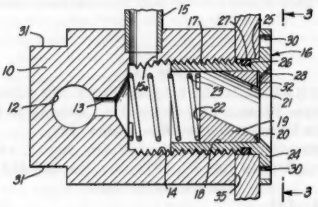
an electrical input circuit and control means operatively associated with said first and second valve means and said input circuit for causing said first valve means to be open when electric current is supplied to said input circuit and causing said second valve means to be open when said cover is in open position and the temperature in said incinerator toilet at a predetermined location is above a predetermined value.

3,890,655

WHIRLPOOL JET FOR BATHTUBS

Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733

Filed Aug. 27, 1973, Ser. No. 392,046
Int. Cl. A47k *3/10*
U.S. Cl. 4—178 **7 Claims**



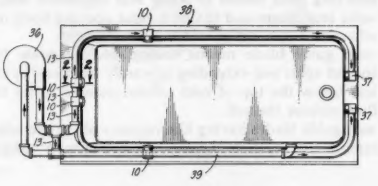
1. A whirlpool jet for bathtubs and the like comprising a housing, a chamber formed within said housing, a water inlet connected at one end thereof to a source of water supply under pressure and at the opposite end thereof to the inner end of said chamber, a Venturi air inlet extending through said housing to the inner end of said chamber, whereby the movement of water through said chamber is speeded by a Venturi effect, a water outlet extending through a circular opening in the wall of the bathtub, said water outlet being threadedly mounted within the outer end of said chamber, said water outlet having an annular radial flange, said flange having an inner surface abutting against the inside of the bathtub wall, said housing having a flat outer end abutting against the outside of the bathtub wall, said water outlet having an annular groove formed therein adjacent to said flange, a resilient O-ring bushing mounted in said groove, said bushing making sealing engagement with the inner edge surface of said opening, the bathtub wall upon rotational tightening of said water outlet with respect to said housing being held between said flange and said housing to mount said jet on the bathtub without any fastening members being connected to the bathtub, the threaded engagement between said water outlet and housing providing automatic adjustment of said jet to fit various thicknesses of bathtub walls.

3,890,656

WHIRLPOOL JET FOR BATHTUBS

Cleo L. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733

Continuation-in-part of Ser. No. 392,046, Aug. 27, 1973. This application May 16, 1974, Ser. No. 470,369
Int. Cl. A47k *3/10*
U.S. Cl. 4—178 **5 Claims**



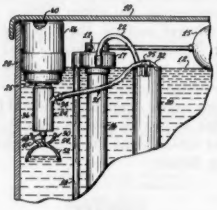
1. A whirlpool jet assembly for bathtubs comprising a plurality of housings spaced around the exterior of a bathtub, each of said housings having a transversely directed water inlet opening and an adjacent transversely directed air inlet opening disposed above said water inlet opening, a horizontally directed water supply pipe extending around the exterior of said bathtub and directly connected to each of said water inlet openings without fittings, a horizontally directed air supply pipe extending around the exterior of said bathtub and directly connected to each of said air inlet openings without fittings, each of said housings having a horizontally directed water passage extending from said water inlet opening to a mixing chamber within said housing, a venturi air passage extending vertically from said air inlet opening into said mixing chamber, whereby the movement of water into and through said chamber is speeded by venturi action, a horizontally directed water outlet extending between said mixing chamber and the interior of said bathtub, and a jet outlet control mounted in the outer end of said water outlet for directing water into said bathtub.

3,890,657

CHEMICAL DISPENSER FOR TOILET

Roy M. Gray, 2102 N. 26th Pl., Phoenix, Ariz. 85008

Filed May 16, 1974, Ser. No. 470,592
Int. Cl. E03d *9/02*
U.S. Cl. 4—223 **9 Claims**



1. A dispenser for delivering a predetermined amount of liquid to the toilet bowl of a toilet tank combination each time the toilet is flushed, said dispenser comprising:

a. a liquid reservoir mountable within the flush tank of the toilet;

b. a housing attached to said liquid reservoir and having a liquid metering chamber formed therein which is in liquid receiving communication with said liquid reservoir; eservoir;

c. delivery means on said housing through which liquid from the metering chamber thereof is delivered to the toilet bowl;

d. valve means within said housing for controlling the flow of liquid between said liquid reservoir and the metering chamber of said housing, said valve means when open allows liquid to enter into the metering chamber and will close when the metering chamber is substantially filled;

e. a piston reciprocally movable within the metering chamber of said housing for holding said valve means closed between flushing operations of the toilet and for allowing said valve means to open upon commencement of a flushing operation, said piston adapted to pump the liquid from the metering chamber of said housing to said delivery means as a flushing operation nears completion; and

f. float means within the flush tank of the toilet and coupled to said piston for reciprocally moving said piston in response to the emptying and filling of the flush tank during a flushing operation of the toilet.

3,890,658

FOLD-OPEN CONVERTIBLE OCCUPANT-RECEIVING UNIT OF FURNITURE

Frank W. Petersilie, Boone, N.C., assignor to Investments and Innovative Concepts, Inc., Boone, N.C.

Filed Aug. 29, 1974, Ser. No. 501,623
Int. Cl.[2] A47B *83/00*; A47C *17/00*
U.S. Cl. 5—2 B **18 Claims**

1. A fold-open, convertible, occupant-receiving, unit of furniture characterized by being constructed for easily converting to and from a folded-close unit of furniture with an upstanding side and back portion for use as a sofa, chair or the like and to and from a folded-open, flat unit of furniture of a predetermined geometric shape with no upstanding portions for use as a bed, ottoman or the like; said unit of furniture comprising:

a first member of predetermined shape generally defining one half of the folded-open outside configuration of said unit of furniture;

a second member having the same general outside configuration and shape as said first member for being generally symmetrical therewith and defining the other half of the folded-open configuration of said unit of furniture when placed in side-by-side position therewith and having a cut out therein to define a void therethrough;

means for hingedly connecting said first member to said second member for pivotal movement of said second member to and from a folded-close, superimposed position on top of said first member wherein said first member provides an upstanding side and back portion, said cut out in said second member provides an occupant receiving void in said second member and the portion of said first member contained within said cut out of said second member provides an occupant receiving seat portion, and to and from a folded-open position in side-by-side relation with said first member for providing a flat unit of furniture with no upstanding portions; and

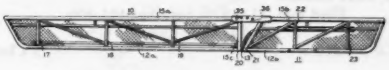
means for being positioned within said cut out of said second member when said second member is in the folded-open position thereof for filling the cut out to provide a generally continuous flat surface for said unit of furniture in the folded-open position thereof.

3,890,659

SPLINT STRETCHER

Samuel M. Staubs, 1204 Duncan St., Key West, Fla. 33040

Filed June 24, 1974, Ser. No. 482,147
Int. Cl.[2] A61G *1/02*
U.S. Cl. 5—82 **2 Claims**



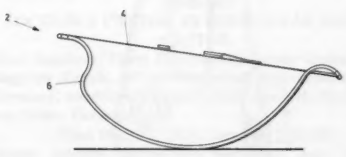
1. A splint stretcher having a framework including a pair of spaced apart upper and lower longitudinally extending side members on each side thereof, the lower ones of said side members being hinged for pivotal up and down movement at a frame pivot point intermediate their length, cross members extending between the lower side members on each side of the frame pivot point to form a stretcher bed frame with a body position and a hinged leg and foot portion, each of the upper side members being interrupted at a point intermediate their length in the vicinity of said frame pivot point to form first and second upper side member sections, the interrupted upper side member of the upper body stretcher portion being extended downward at an angle of about 90° to be secured to the corresponding lower side member at the body portion side of the frame pivot point, the interrupted upper side member of the leg and foot stretcher portion being extended downward at an angle greater than 90° to be secured to the corresponding lower side member at the leg and foot portion side of the frame pivot point, one of the upper side member sections on at least one side of the stretcher having a pin receiving aperture in the side member adjacent the point of interruption, the corresponding other one of said side member sections on at least one side of the stretcher having an adjusting brace secured to extend towards the one side member section in alignment with the longitudinal axis of the other side member, and each brace having a plurality of pin receiving apertures spaced along its length whereby the leg and foot portion of the stretcher may be secured in desired ones of different positions relative to the body portion with a respective pin extending through aligned apertures of the respective upper side frame section and adjusting brace.

3,890,660

FURNITURE

Richard C. Pedler, 802 Exeter Hall, Sol Harris Crescent, Durban, Natal, South Africa

Filed May 13, 1974, Ser. No. 469,696
Int. Cl.[2] A47D *9/00*
U.S. Cl. 5—101 **3 Claims**



1. A bed for a baby comprising a pair of spaced apart, substantially parallel, rocker elements formed from steel rod, each element being curved towards each end to form oppositely directed substantially S-shaped portions, the free ends of each element being directed away from each other, a pair of substantially straight, parallel, spaced apart cross elements joining corresponding free ends of the side elements, and a web secured to and tensioned between the side elements, the web being substantially inextensible longitudinally, and means for restraining a baby on the web with its head towards one cross element, its feet towards the other, the configuration of the rocker elements being such that when the bed is occupied

it tends to assume an equilibrium position in which the baby's head is not lower than its feet.

3,890,661

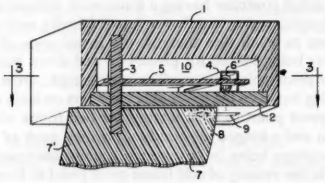
SURFBOARD RUDDER-FIN COMBINATION

Robert F. Johnson, 82 Cambridge Rd. N.W., Calgary, Alberta T2K 1R3, Canada

Filed Feb. 21, 1974, Ser. No. 444,406

Int. Cl. A63c *15/00*

U.S. Cl. 9—310 B **1 Claim**



1. In combination
a. a surfboard body portion,
b. a rudder mounted thereunder,
c. a vertical shaft, one end of which is rotatably mounted in the body portion and the other end of which is integral with the rudder in such space relationship that the two lateral rudder surface portions on each side of the point of integration are unequal in area dimensions,
d. a lever arm secured at right angles to and near the end of the shaft which is rotatably mounted, and
e. resilient means movable in the fore and aft direction relative to the vertical shaft for effectively changing the length of the lever arm to vary the force required for rudder action.

3,890,662

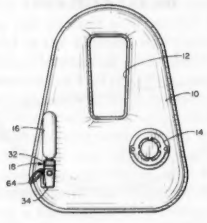
REFILLABLE PRESSURIZED GAS CARTRIDGE AND ATTACHMENT MEANS FOR REFILLING SAME

Robert E. Roberts, Carson, Calif., assignor to Under Sea Industries, Inc., Compton, Calif.

Filed Nov. 5, 1973, Ser. No. 413,187

Int. Cl. B63c *9/00*

U.S. Cl. 9—313 **3 Claims**



1. In scuba diving equipment:
a. a buoyancy compensator having provisions for attachment to the upper torso of a diver;
b. said buoyancy compensator having an air-inflatable chamber to increase the positive buoyancy of the diver or to counterbalance the negative buoyancy of the diver;
c. a detonator housing fitted to, and carried by, the buoyancy compensator;
d. said detonator housing having passage means communicating at one end with said chamber;
e. a gas cartridge having a neck;
f. a normally closed valve mounted in the cartridge neck and having a valve actuator accessible at the neck that is movable inwardly to open the valve;
g. said detonator housing and said cartridge having means detachably coupling the cartridge neck to the other end of said passage means to establish communication between said passage means and the interior of said cartridge via said valve;
h. a detonator rod slidably mounted on said detonator cartridge and movable from a retracted position to an advanced position in which said valve actuator is engaged to open said valve; and
i. a detonator lever manipulable for operating said detonator rod.

3,890,663

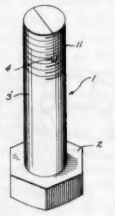
METHOD OF FORMING A COTTER KEY HOLE IN A BOLT

Matthew J. Lebryk, Rte. 1, Custer, Wis.

Filed May 6, 1974, Ser. No. 467,010

Int. Cl. B23g *9/00*

U.S. Cl. 10—27 R **4 Claims**



1. A method of forming a transverse hole in the shank of a bolt, comprising the steps of longitudinally splitting the end of the bolt shank into two diverging connected sections, said sections being connected at a juncture and each connected section having an inner surface facing the inner surface of the other connected section, inserting a cutting tool longitudinally between the two diverging connected sections and cutting a transverse groove at said juncture, and crimping the two sections together to bring the inner surfaces into contiguous relationship and reform the shank with the groove comprising a transverse hole extending through the reformed shank.

3,890,664

SURFACE TREATMENTS

Raymond Hanson, Rearsby, England, assignor to USM Corporation, Boston, Mass.

Filed Nov. 21, 1973, Ser. No. 417,871

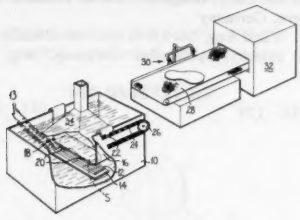
Claims priority, application United Kingdom, Nov. 23, 1972, 54229/72; Oct. 11, 1973, 47452/73

Int. Cl. A43d *00/00*

U.S. Cl. 12—146 B **8 Claims**

1. The method of surface pretreatment of bodies of nonconductive synthetic elastomer material to improve the ability of that surface to be coated or adhesively bonded comprising establishing an electrical potential across an anode and a cathode in a body of aqueous electrolyte to generate at said anode, products of electrolysis reactive with said elastomer to form reaction products more readily wet and bonded by coatings and adhesive compositions, said anode being substantially inert to products of electrolysis generated at said anode, disposing the surface to be treated in said body of electrolyte closely adjacent to said anode for engagement and reaction with said products of electrolysis as they are formed and maintaining said surface adjacent said anode for a period for reaction of the elastomer at said surface with products of

electrolysis generated at said anode to form on said body a surface of reacted elastomer integral with the elastomer of



said body and readily wetted and strongly adhered to by coatings and adhesives.

3,890,665

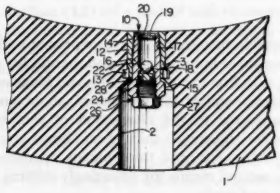
PIPELINE CLEANING BALL AND VALVE STRUCTURE

Murl R. Richardson, Fort Worth, Tex., assignor to Oil States Rubber Co., Arlington, Tex.

Filed Oct. 1, 1973, Ser. No. 402,082

Int. Cl. B08b *9/04*

U.S. Cl. 15—104.06 R **6 Claims**



1. A pipeline cleaning ball and valve structure, comprising:

a. an inflatable ball having a hollow center surrounded by thick walls of elastomeric material defining the outer surfaces of the ball, and having a wall recessed part-way into one wall from outside the ball and the well joining a bore extending the rest of the way through the well into the center of the ball;

b. a valve assembly in the well and including a sleeve member bonded to the elastomeric material at the bore and internally threaded, and including a valve-carrier member having external threads by which it is removably secured in the threaded sleeve member and said carrier member having an opening through it with a check valve in the opening located within the thickness of the wall of the ball and recessed within the length of the carrier member, and including a plug member operative to removably close and seal the opening through the valve carrier member, the valve assembly and plug member being recessed in said well beneath the outer periphery of the ball by a distance amounting to a substantial proportion of the thickness of the wall of the ball.

3,890,666

SURFACE TEXTURE MODIFICATION DEVICE FOR CARPETS

Thomas J. McKenzie, 6230 N. Camino, Tucson, Ariz. 85718

Filed July 3, 1973, Ser. No. 376,152

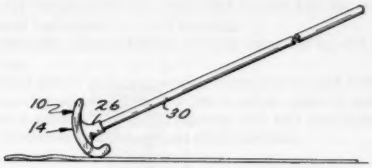
Int. Cl. A47l *13/00*

U.S. Cl. 15—142 **6 Claims**

1. A surface texture modification device for carpets comprising:

a monolithic head having an elongated, continuous curved outer surface, a portion of which is convex;

the head as viewed in cross-section comprising an inverted comma having an upper tail and a lower ball; and



elongated handle means secured to the head for permitting the outer surface of the head to be pushed across a carpet to modify the texture of the carpet.

3,890,667

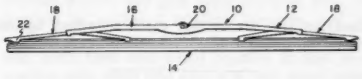
WIPING ELEMENT OF A WIPER BLADE

John A. Mason, Valparaiso, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Oct. 16, 1973, Ser. No. 406,809

Int. Cl. B60s *1/38*

U.S. Cl. 15—250.42 **3 Claims**



1. In a wiper assembly having a wiper blade and a pressure-distributing superstructure operatively connected thereto, said wiper blade having a resilient wiping element and a flexible backing strip, said superstructure slidably engaging with said backing strip at a plurality of spaced apart locations thereon, in combination, said wiping element having a retention portion and an enlarged intermediate portion defining a pair of oppositely facing longitudinal grooves therebetween, a plurality of gripping means in the lower part of each groove near each end portion thereof, and spacer means in each groove in juxtaposed relation to each plural gripping means and disposed in the upper part of each of said grooves, said gripping means and said spacer means are formed integrally with said retention portion and said intermediate portion of said wiping element whereby the backing strip is gripped by said gripping means as said spacer means abuts the upper surface of said backing strip to prevent distortion of the wiping lip of said wiping element.

3,890,668

LOCKABLE CASTOR, IN PARTICULAR SWIVEL CASTOR

Herbert Stosberg; Horst Fleishmann; Günter Reinhards, and Siegfried Engels, all of Wermelskirchen-Tente/Rhineland, Germany, assignors to Tente-Rollen G.m.b.H., Wermelskirchen-Tente, Germany

Filed Dec. 22, 1971, Ser. No. 210,759

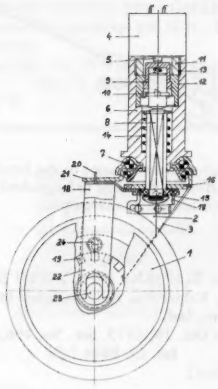
Claims priority, application Germany, Jan. 20, 1971, 2102509

Int. Cl. B60b *33/00*

U.S. Cl. 16—35 **11 Claims**

1. A castor comprising a fixing pin, a castor fork mounted on the fixing pin, a wheel mounted in the hollow of the castor fork, a locking mechanism including movable catch members for arresting a movement of the wheel, the catch members being accommodated in the hollow of the castor fork, an electromagnet with a movable magnetic core and which is force-lockingly connected to the catch members, a movable actuating pin connecting the movable magnet core and the catch members, said electromagnet being united with and a

part of said fixing pin, and a spring operatively interposed between the electromagnet and the catch members so that the



electromagnet can act on the catch members against the pressure of the spring.

3,890,669

LOCKABLE CASTOR, IN PARTICULAR SWIVEL CASTOR

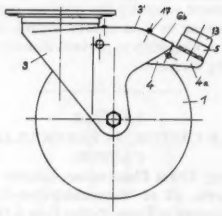
Günter Reinhards, Wermelskirchen, Rhineland, Germany, assignor to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie, Wermelskirchen-Tente, Rhineland, Germany

Filed Jan. 8, 1974, Ser. No. 431,659

Claims priority, application Germany, Mar. 3, 1973, 2310775

Int. Cl. B60b *33/00*

U.S. Cl. 16—35 **8 Claims**



1. A castor, in particular a swivel castor, comprising a wheel which is supported in a wheel clevis and locking means for locking the rotation of the wheel and/or the swivel motion of the wheel clevis including a clamping lever that is pivotably supported in the clevis cavity and is pivotable and lockable in its locking position by operation of a push-button control element, characterised in that the push-button control element is attached or fastened on the pivotable clamping lever as a part thereof and so that the push-button control element forms a pivotable unit with the clamping lever, and a movable lever locking element which also is attached or fastened on the pivotable clamping lever and which can be locked itself in its locking position by said push-button control element after locking said pivotable clamping lever.

3,890,670

ADJUSTABLE FURNITURE HINGE

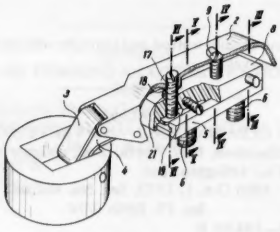
Gerhard Sewing, Lohne, and Jurgen Bachor, Kirchlengern, both of Germany, assignors to Paul Hettisch & Co., Kirchlengern, Germany

Filed Aug. 16, 1974, Ser. No. 498,226

Claims priority, application Germany, Aug. 21, 1973, 2342113

Int. Cl.² E05D *7/04*

U.S. Cl. 16—129 **10 Claims**



1. An adjustable furniture hinge, comprising a hinge member and an elongated hinge arm pivoted thereto for movement about a pivot axis; first means mounting said hinge arm remote from said hinge member for movement about another axis extending transverse to the elongation of said hinge arm; second means for adjustingly shifting said hinge arm longitudinally of said other axis; and third means operable independently of said second means for adjustingly shifting said hinge arm lengthwise of itself.

3,890,671

RECESSED HINGES FOR ARTICLES OF FURNITURE

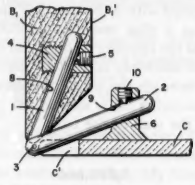
Marco Fantoni, Udine, Italy, assignor to McClure Furniture Industries, Inc., Milton, Pa.

Filed June 17, 1974, Ser. No. 480,276

Claims priority, application Italy, Sept. 21, 1973, 83429/73

Int. Cl. E05d *11/00*

U.S. Cl. 16—137 **4 Claims**



1. A hinge system for furniture articles and the like, comprising: first and second elongated shafts; means pivotally coupling respective end portions of said shafts to each other; means adjustably mounting said shafts to respective relatively movable adjacent panels and at an angle to the principal planes of said respective panels; and means for adjustably securing said shafts to said respective panels.

3,890,672

FRICTIONALLY ADJUSTABLE HINGE ASSEMBLY WITH NONROTATABLE HINGE PIN BEARING SLEEVE

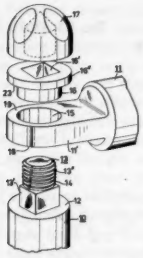
Nils Ture Lennart Berthagen, Manadsvagon 74, S-175 42 Jarfalla

Filed June 14, 1974, Ser. No. 479,376

Claims priority, application Sweden, Sept. 9, 1973, 73124430

Int. Cl. E05d *11/08*

U.S. Cl. 16—141 9 Claims



1. In a hinge assembly including two elements (10,11) mounted for pivotal movement relative to each other, a first abutment surface (12) on a first of said elements, a shaft (13) extending outwardly from and perpendicular to said abutment surface and having a non-round lower portion (13′) adjacent the first abutment surface and an upper portion, a flat web member (11′) having upper and lower bearing surfaces extending from the second of said elements and defining a cylindrical bearing hole (15) therein through which the shaft extends, a sleeve (16) having an outwardly extending flange (16″) defining a second abutment surface (23), a central passageway (16′) having the same non-round configuration as the lower portion of the shaft, and an external cylindrical bearing surface, the sleeve being fitted over and axially slidable on the shaft with the non-round portion engaging the central passageway in a non-rotatable manner and the bearing surface accommodated within the bearing hole, and with the first and second abutment surfaces spaced from but facing each other and, respectively, facing said upper and lower bearing surfaces; of the web, and locking means (17) mounted on the upper portion of the shaft retaining the sleeve thereon, the improvements characterized by:

a. the axial length of the external cylindrical bearing surface being greater than the thickness of the web, and

b. the locking means engaging the upper portion of the shaft to such a depth that the end of the sleeve remote from the flange bears against the first abutment surface, whereby the shaft, sleeve and locking means assembly is rotatable in the bearing hole while having a limited end play defined by the difference between the axial length of the external cylindrical bearing surface and the thickness of the web.

3,890,673

AUTOMATIC HEAD SPLITTER

David J. Neubauer, 8086 Cedar St., Omaha, Nebr. 68124

Filed July 5, 1973, Ser. No. 376,688

Int. Cl. A22b *5/20*

U.S. Cl. 17—1 A 8 Claims

1. An automatic head splitter for splitting the head of an animal, the splitter comprising:

a frame having a compartment formed therein and a horizontal top surface;

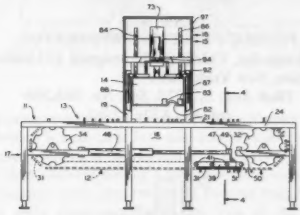
a movable bed operably disposed in said compartment, with said bed forming at least a portion of said horizontal top surface;

a housing mounted on top of said frame and having an opening formed therein which is disposed transversely of said bed and which is defined on the bottom thereof by said bed;

power means operably connected to said bed for moving said bed relative to said housing;

a vertically disposed knife movably mounted in said housing;

second power means operably connected to said knife for moving said knife from a first position distal of said bed to a second position proximate said bed and from said proximate position to said distal position;



a gate movably mounted to said housing and having a tab secured thereto said gate being movable from an open position to a closed position covering said opening wherein said second power means is operable to move said knife from said distal position to said proximate position only when said gate is in said closed position;

latch means secured to said knife, said latch means coactable with said tab for moving said gate to said open position when said knife moves from said proximate position to said distal position; and

third power means mounted in said housing and operable to disengage said latch means from said tab thus permitting said gate to move from said open position to said closed position by gravity.

3,890,674

APPARATUS FOR REMOVING THE BONES FROM POULTRY

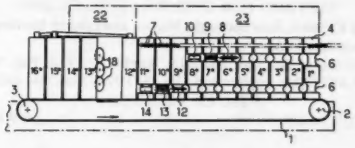
Maurice Fradin, Saint Jean de Monts, France, assignor to Agence National de Valorization de la Researche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 30, 1973, Ser. No. 420,479

Claims priority, application France, Dec. 1, 1972, 72.42734; Nov. 13, 1973, 73.40231

Int. Cl. A22b *3/08*

U.S. Cl. 17—11 7 Claims



1. Apparatus for removing the bones from poultry, comprising a base conveyor to receive the poultry thereon and cause it to travel from an infeed end to an outfeed end, two rows of vertically mounted rollers, one at each side of said conveyor, a plurality of said rollers proceeding inwardly from said infeed end being peripherally grooved at two axially separated locations, a row of horizontally mounted rollers arranged above said conveyor to press down on the incoming poultry, cutter means on at least two laterally opposed ones of said vertically mounted rollers, wheels having curved cutting flutes arranged on at least two other laterally opposed ones of said vertical

rollers, said wheels being rotatable in a direction opposite to that of the other vertically mounted rollers, deflecting means consisting of selected ones of said vertically mounted rollers, two hinged systems comprising selected groups of said vertically mounted rollers at said outfeed end with said rollers being mounted on support members, said hinged systems forming a pair of inwardly tapering walls to enclose the poultry carcass minus its legs and wings, said hinged systems also incorporating a plurality of cutters arranged in vertical lines with each of said cutters arranged obliquely to said vertical line, hoppers positioned to receive bones from the wings and legs and the flesh respectively, and a hopper at the outfeed end of the apparatus to receive the stripped carcass.

3,890,675

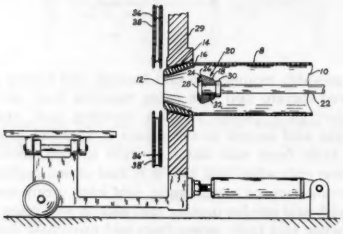
PRODUCT STUFFING APPARATUS

Joseph A. Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,306

Int. Cl. A22c *11/02*

U.S. Cl. 17—41 **2 Claims**



1. Apparatus for stuffing a viscous pumpable product into a flexible casing, which apparatus comprises

a. a stuffing horn having an inlet end and a discharge end for said product, said discharge end having an external portion and an internal tapered portion;

b. a movable product stoppering means internally mounted in said stuffing horn and having a tapered portion adapted to seat against the internal tapered portion of said discharge end and a circumferential knife edge in advance of said tapered portion thereof;

c. means for advancing product to be stuffed through said horn; and

d. means for moving said stoppering means into and out of engagement with said internal tapered portion.

3,890,676

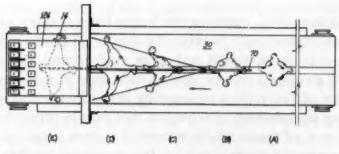
METHOD FOR EVISCERATING CLAMS

Harold F. Snow, Scarborough, Maine, assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 244,616, April 17, 1972, Pat. No. 3,789,457. This application Oct. 3, 1973, Ser. No. 403,105

Int. Cl. A22b *3/00*

U.S. Cl. 17—45 **9 Claims**



1. A method for removing viscera or any part thereof from a clam comprising disposing a clam on a moving surface with its root at the trailing end; moving the two muscles of the clam toward the sides of the moving surface; and applying force in an eviscerating section to the clam body between the muscles to squeeze out viscera from the clam.

3,890,677

FIBER DRAFTING APPARATUS

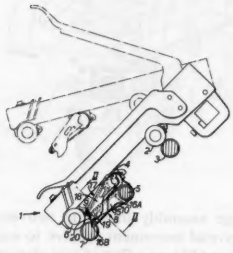
John Michael Noguera, 1 Greville House, Kinnerton St., London S.W. 1, England

Continuation-in-part of Ser. No. 273,610, July 20, 1972, abandoned. This application Nov. 9, 1973, Ser. No. 414,430

Claims priority, application United Kingdom, July 15, 1971, 33380/71

Int. Cl. D01h *5/88*

U.S. Cl. 19—255 **2 Claims**



1. A textile fibre drafting cradle arrangement comprising a lower cradle; a rear platform part carried by said lower cradle; a forward platform part carried by said lower cradle and being an extension of said rear platform part; forward lateral flaps extending from said forward platform part of said lower cradle; and an upper cradle with forward end engaged with said forward platform part in assembled position, said forward platform part being a lower tensor inter-changeably locatable in said lower cradle to determine the permitted maximum tensor spacing at the delivery opening whereby different lengths of fibre can be spun with the same platform tensor, said upper cradle having a width such that side walls thereof are disposed on either side of said lower cradle in the assembled position, said side walls terminating at their forward ends in hook parts that engage under said forward lateral flaps extending from said forward platform part of said lower cradle, said hook parts comprising the only parts of said forward platform part that project laterally beyond the side walls of said upper cradle.

3,890,678

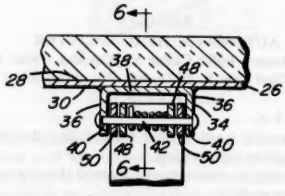
TIE BUTTON

Sidney H. Leonard, Jr., Kenosha, Wis., assignor to Sidney H. Leonard, Sr., Kenosha, Wis., a part interest

Filed July 2, 1974, Ser. No. 485,132

Int. Cl. A41d *25/04*

U.S. Cl. 24—49 C **2 Claims**



1. A tie button for covering and providing ornamentation at the juncture of the lower portion of a necktie knot and the free

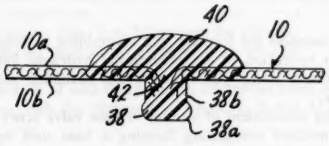
hanging portion of the tie disposed below the knot, said button comprising an ornament body defining front and rear sides, the front side of said body including means rendering the structure ornamental when viewed from the front side thereof, the rear side of said body including curved C-shaped clamp arms opening toward each other and supported at one pair of adjacent base ends from a central portion of the rear side of the body for pivotal movement relative to the body about an axis disposed at generally right angles relative to front-to-rear extending path passing centrally through the body and generally normal to a plane in which the other pair of ends of the clamp arms are swingable between closed operative positions with the other pair of free ends of said arms swung toward each other and open inoperative positions with said other pair of ends of said arms swung away from each other, said arms, when in said closed positions, defining at least a substantially closed generally circular boundary for disposition about said juncture, and means connected between said arms and said body yieldingly biasing said arms toward said operative positions, a pair of apertured mounting flanges outstanding from the rear side of said body in spaced apart generally parallel relation, said base ends of said arms including corresponding pairs of opposite side interdigitated furcations provided with aligned apertures, said flanges including bores aligned with said apertures, and a pivot shaft passed through said apertures and bores defining said axis, said means connected between said arms and said body comprising a butterfly spring having a coiled central portion disposed on the center portion of said pivot shaft between said opposite side furcations and opposite end portions engaged with the outer surfaces of said base ends of said arms and biased toward said free ends of said arms.

3,890,679

GARMENT FASTENER SUBASSEMBLY AND METHOD FOR MAKING THE SAME

Jack Simon, Rye, N.Y., assignor to Athlone Industries, Inc., Parsippany, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,245
Int. Cl. A44b *17/00*
U.S. Cl. 24—213 **6 Claims**



1. A method for making a fastener subassembly comprised of a fibrous strip member and a unitary fastener element extending in part through said strip member and secured thereto, comprising the steps of: (a) arranging first and second dies, each defining a mold cavity, in opposed clamping relation to a non-apertured fibrous strip member; (b) supplying successively into one of said dies solidified and fluid molding material under pressure sufficient both to force said solidified material through said strip member to thereby rupture said strip member and define a passage in said strip member extending between the mold cavities and to force said fluid molding material into said passage and into each said mold cavity to fill said passage and each said mold cavity with said fluid molding material; (c) solidifying molding material in said passage and in each said cavity; and (d) separating said dies from said strip member.

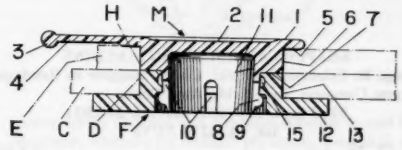
2. The fastener subassembly provided by practicing the method claimed in claim 1.

3,890,680

FASTENER

Toshitsugu Furuya, Hyogo, Japan, assignor to Furuya Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Aug. 16, 1973, Ser. No. 388,788
Claims priority, application Japan, Aug. 16, 1972, 47-82277
Int. Cl.² **A44B** *17/00*
U.S. Cl. 24—214 **2 Claims**



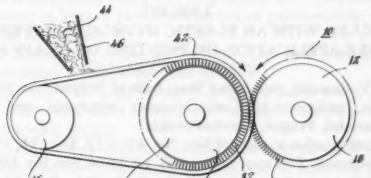
1. A fastener comprising a counterpart element and a main element which is insertable into said counterpart element, said main element having a cylindrical insert portion including an extruded skirt element having a raidally extending first portion of semi-circular cross-section and a second leading end portion with walls tapered towards the axis of the cylindrical insert portion and a plurality of slots in the open end thereof, said counterpart element including a cylindrical head portion in the center thereof and a flange portion around said cylindrical head, the cylindrical head comprising in sequence a first aperture means having a diameter smaller than the diameter of said first portion of said skirt element and a ring shaped groove for loosely engaging said first portion of said skirt element therein, shoulder means having a diameter less than the diameter of said first aperture means, and a second aperture means having a diameter greater than the diameter of said skirt element wherein when said main element is partially inserted into said counterpart element, said first aperture means engages said skirt element to temporarily hold said main element in said counterpart element and when said main element is completely inserted into said counterpart element said skirt element is firmly held in said second aperture means by said shoulder means.

3,890,681

APPARATUS FOR NEEDLING TEXTILES

Eugene Zoltan Fekete, East Greenbush, and Raymond J. Grady, Colonie, both of N.Y., assignors to Huyck Corporation, Wake Forest, N.C.

Filed July 11, 1974, Ser. No. 487,668
Int. Cl. D04h *18/00*
U.S. Cl. 28—4 R **14 Claims**



1. An apparatus for needling textiles comprising

a needle support member which is capable of traveling along a closed travel path and has a multiplicity of felting needles affixed thereto, the long axes of which are oriented substantially normal to the surface of said member, and a backing member which is capable of traveling along a closed travel path and has a surface comprising pressure-tolerant, laterally displaceable, elongated fabric support members which are affixed at one end to the surface of said backing member and have their long axes

oriented substantially normal to the surface of said backing member;

said closed travel paths each aggregating 360° of angular change and being so positioned with respect to each other that at least at one point along said paths, a portion at least of said needles will reside among said elongated members.

3,890,682

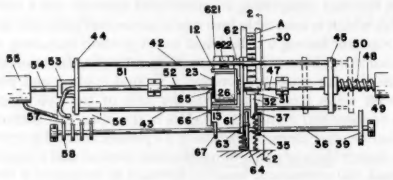
SHAPING AND TURNING MACHINE

George R. Eckstein, Fairfield, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Sept. 29, 1951, Ser. No. 248,921

Int. Cl. B21d *51/54*

U.S. Cl. 29—1.3 1 Claim



1. Apparatus for operating on hollow cylindrical workpiece comprising a tubular forming die of solid one-piece cross section, means for feeding workpieces into alignment with said die, means for thrusting workpieces into said solid die whereby said workpieces are shaped to the configuration of said die, means for revolving said die about an axis concentric with the workpiece therein, a tool, means for applying said tool to said workpiece while rotating said die to perform an operation thereon and for retracting said tool upon completion of said operation, means for ejecting said workpiece from said die comprising a tubular member and connections thereto for applying a jet of compressed air to the interior of said hollow workpiece, a carriage mounting said workpiece thrusting and ejecting means, and hydraulic means for reciprocating said carriage in the direction of the axis of said die.

3,890,683

ROLLER WITH AN ELASTIC HYDROGEL LAYER FOR DYE APPLICATION OR PRINTING ON GLASS AND OTHER MATERIALS

Jiri Vodnansky, and Artur Stoy, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved No. 3 Narodni, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 427,432, Dec. 21, 1973, abandoned. This application Apr. 10, 1974, Ser. No. 459,618

Claims priority, application Czechoslovakia, Dec. 22, 1972, 8917-72

Int. Cl. B21b *31/08*

U.S. Cl. 29—132 15 Claims

1. A roller suitable for the application of coloring materials onto a surface, comprising (I) an inner core of a material which does not substantially swell in aqueous solutions, (II) an outer surface including (1) copolymers of acrylonitrile with (2) at least one monomer selected from the group consisting of acrylamide, methacrylamide, N-lower alkyl acrylamides, N-lower alkyl methacrylamides, ethylenically unsaturated monocarboxylic acids, ethylene sulfonic acid, salts of said acids and compatible mixtures thereof and (3) at least one swelling agent selected from the group consisting of C_{1-4} alkylene and polyalkylene glycols and their methoxy and ethoxy derivatives, glycerol and acetyl derivatives thereof, (a) phenols, aromatic alcohols, hydroaromatic alcohols, C_{1-14} aliphatic alcohols, esters of (a), (b) fatty acids, and quarternary salts and esters of (b).

3,890,684

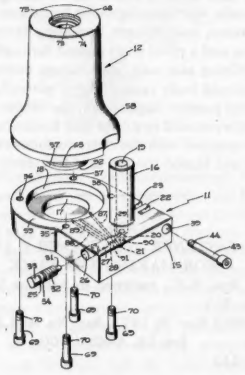
METHOD OF MAKING A HYDRAULIC JACK

Erven Tallman, 15934 S. Figueroa St., Gardena, Calif. 90247

Filed May 9, 1974, Ser. No. 468,532

Int. Cl. B23p *15/00;* F15b *15/18;* B66f *3/24*

U.S. Cl. 29—156.4 R 8 Claims



1. A method for forming and assembling a weight lifting jack for reception of a conventional hydraulic ram and a conventional pump piston and pump actuating mechanism therefor,

and for attachment of a pump release valve screw,

said method comprising forming a base unit by casting therein concentric radially spaced recesses having annular walls

and circumferentially spaced fastening holes extending from the bottom upwardly,

casting a pump housing on the base unit with a downwardly open pump cylinder bore therein,

forming a relief valve bore in a communicating relationship with the exterior and said pump cylinder bore,

and forming hydraulic passages between said recesses and said pump cylinder bore,

forming a vertical unit by casting concentric radially spaced inner and outer cylinders whereby to provide a ram chamber in the inner cylinder and a reservoir between the inner and outer cylinders closed by material of the casting at the outer end,

cast forming inner ends of the cylinders to fit into the respective inner and outer recesses,

casting circumferentially spaced anchoring recesses in respective alignment with said anchoring holes,

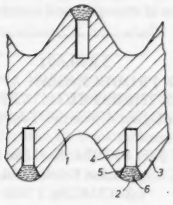
and finally fastening said units together with self tapping bolts extending between said holes and said recesses.

3,890,685

METHOD FOR MANUFACTURING HOLLOW SCREWS FOR HEAT EXCHANGERS

Helmut Rünte, and Peter Schwartz, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 30, 1974, Ser. No. 474,622
Claims priority, application Germany, June 6, 1973, 2328793
Int. Cl. B23p 15/02
U.S. Cl. 29—156.8 H 4 Claims



1. A method for manufacturing hollow screws for heat exchangers, comprising cutting a groove into the screw thread along the screw comb, and joining the edges of the groove walls together by an impervious weld seam.

3,890,686

SURFACE COATING FOR FERROUS ALLOY PARTS

Jacques-Jean Caubet, Andrezieux-Boutheon, France, assignor to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement, Andrezieux Boutheon (Loire), France

Filed Apr. 24, 1974, Ser. No. 463,923
Claims priority, application France, Apr. 25, 1973, 73.15787
Int. Cl. B32b 15/18, 15/20
U.S. Cl. 29—196.1 3 Claims

1. A mechanical part made of ferrous alloys and coated with a surface layer, characterized in that said layer enables the part to resist wear, seizing, corrosion, and shocks at the same time, while simultaneously the ability to adsorb a film of lubricating oil increases without the resistance to fatigue being altered, said layer consisting essentially of the $FeSn_2$, FeSn, $FeSnC_x$ phases (x ranging from 0.7 to 1.3), according to the following proportions:

$FeSn_2$ ranging from 5 to 30 percent by volume
FeSn ranging from 60 to 95 percent by volume
$FeSnC_x$ ranging from 0 to 10 percent by volume,

the distribution of said three phases within the layer being in accordance with the diagrams of FIGS. 1, 2 and 3, respectively.

3,890,687

METHOD FOR SPRING ASSEMBLY

Joseph H. Goldberg, 505 N. Lake Shore Dr., Chicago, Ill. 60611

Filed Nov. 4, 1974, Ser. No. 520,472
Int. Cl. B21f 35/00; B23p 13/00
U.S. Cl. 29—173 8 Claims

1. A method of producing planar circular, coiled springs having radial uniformity, said method comprising the steps of:

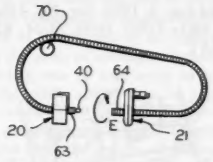
a. coiling wire into elongated helical spring;

b. cutting said spring to a precise length which is equal to the circumference of said circular spring plus an overlap length;

c. inserting a connecting rod into one end of said circular spring helix, the diameter of said rod fitting into the helix with a snugness such that it does not easily fall out, and the length of said rod being approximately equal to the overlap length;

d. preliminarily turning said spring a predetermined rotary distance in a first direction to pre-stress said spring, and

e. bringing together and intertwining the tip ends of said elongated spring by turning said spring said predetermined rotary distance in a direction opposite to said first direction, whereby no residual pre-stress remains in said spring.

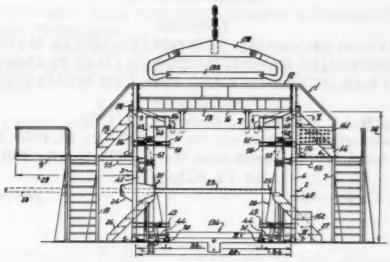


3,890,688

APPARATUS FOR THE CONSTRUCTION AND OR ASSEMBLY OF PREFABRICATED BUILDING SECTIONS OR ROOM UNITS

Cornelis Van Der Lely, 7, Bruschenrain, Zug, Switzerland

Filed May 17, 1973, Ser. No. 361,290
Int. Cl. B23p 19/00
U.S. Cl. 29—200 R 52 Claims



1. Apparatus for manufacturing prefabricated building sections from prefabricated top, bottom and side components constructed at least in part of metal beams and concrete, the apparatus comprising:

lower positioning means adapted to carry in a horizontal disposition a said bottom component;

a frame which includes vertically disposed frame parts, one of said frame parts located on each side of said lower positioning means;

side component positioning means mounted on each said frame part for performing the function of receiving and positioning a side component relative to said bottom component carried by said lower positioning means, side component stop means associated with said side component positioning means for performing the function of maintaining each said side component for securing in its desired position relative to said bottom component;

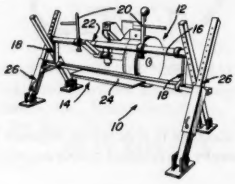
top component positioning means and top component stop means associated with said top component positioning means mounted on the upper aspect of each said frame part for performing the function of positioning and maintaining a said top component for being rigidly secured to said side component.

3,890,689

HOLDING FRAME FOR CABLE SPLICING TOOLS AND METHOD FOR SPLICING CABLES

Donald D. Copas, 303 Fredericks Ln., Jefferson City, Mo. 65101

Filed Jan. 3, 1974, Ser. No. 430,486
Int. Cl. H01r 43/00; H05k 13/04; B23q 7/00
U.S. Cl. 29—203 C 14 Claims



1. A holding frame for buried cables and pedestals for use in connection with cable splicing tools, comprising, in combination:

a. a framework including a support bar and legs for holding the support bar above an associated supporting surface;

b. means for mounting the support bar on the legs;

c. means mounted on the support bar for retaining buried cables and pedestals to be spliced; and

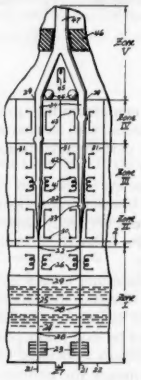
d. means provided on the support bar for attaching a splicing tool to the framework and permitting the tool to splice the retained cable sections.

3,890,690

METHOD OF MAKING REINFORCED METAL MATRIX COMPOSITES HAVING IMPROVED LOAD TRANSFER CHARACTERISTICS AND REDUCED MISMATCH STRESSES

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 769,938, Oct. 23, 1968, Pat. No. 3,663,356. This application May 4, 1972, Ser. No. 250,195
Int. Cl. B23p 17/00
U.S. Cl. 29—404 38 Claims



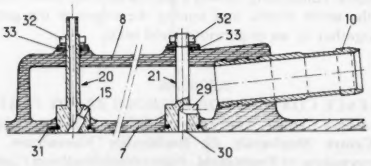
1. The method for making reinforced, metal-matrix composite, comprising: preparing a plurality of elongated, high-strength and high-modulus reinforcing members; dispersing the members in spatial relationship in a strain-hardenable metal matrix; effectively bonding the members to the surrounding matrix at selected, discrete surface regions along their lengths; and stressing the composite sufficiently to locally strain the matrix near the discretely bonded regions whereby the matrix in the space between the members is substantially and selectively though nonuniformly strain-hardened and strengthened and whereby spheres of influence induced by the straining and strain-hardening in the matrix within the space near the discrete regions on one member are caused to significantly overlap similar spheres of influences near the neighboring members so as to substantially increase mechanical interaction and load transfer ability between the one member and the neighboring members through the intervening hardened and strengthened matrix.

3,890,691

METHOD OF PRODUCING AN APPARATUS FOR HYDRO-THERAPEUTIC TREATMENT

Jean-Baptiste Montagne, 4, rue des Tourterelles, 67200 Oberhausbergen, France

Filed July 8, 1974, Ser. No. 486,583
Claims priority, application France, July 9, 1973, 73.26061
Int. Cl. B23p 17/00
U.S. Cl. 29—423 14 Claims



1. A method of producing a vessel for a sanitary apparatus, especially an apparatus for hydro-therapeutic treatment, having channels of integral double-walled structure, comprising the steps of providing a mold having a wall with an outer surface corresponding to the inner surface of the vessel to be produced and being formed in the wall thereof with a row of apertures; placing said mold on a support with the outer surface facing upwardly; fixing coaxially with each of said apertures an insert projecting beyond said outer surface; applying onto said outer surface a first layer of hardenable or polymerizable plastic material with said inserts projecting beyond said first layer; placing on each row of inserts an elongated plug of meltable or dissolvable material having the form of the channel to be produced and provided with passages through which said inserts respectively extend; applying onto the outer surface of said elongated plug an additional layer of plastic material, while said first layer is still in plastic condition, so as to join said additional layer to said first layer; removing said inserts after said layers have hardened to provide in said layers openings corresponding to surface portions of said inserts; removing said elongated plug by melting or dissolving the material thereof; and placing nozzle members having outer surface portions identical with said surface portions of said inserts into said openings previously occupied by said inserts.

3,890,692

PROCESS AND APPARATUS FOR THE REMOVAL OF ARROWS

John J. Jandura, Jr., Main Rd., Towaco, N.J. 07082

Filed Feb. 13, 1974, Ser. No. 442,184
Int. Cl. B23p 19/02
U.S. Cl. 29—427 8 Claims

1. An archery process which comprises discharging from a bow an arrow having a shaft and a head threaded thereto, embedding said head in a substrate from which the force which must be applied to said shaft to effect removal of said arrow may be sufficient to cause deformation of said shaft if applied thereto, unthreading said shaft from said embedded

arrowhead, threadably engaging said arrowhead with a mating threaded end of a greater strength extractor tool having an outer diameter not greater than said shaft, extracting said

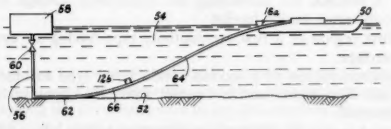
arrowhead from said substrate by use of said extractor tool, recovering said arrowhead by unthreading said recovery arrowhead from said extractor tool threaded end, and rethreading said recovered arrowhead to said shaft.

3,890,693

METHOD FOR CONTROLLED PRESSURIZATION OF A PIPELINE DURING CONSTRUCTION THEREOF

Harold N. Eagleton; Jerome D. Lormand, and Joe S. Herring, all of P.O. Box 36117, Houston, Tex. 77036

Filed Oct. 26, 1972, Ser. No. 301,191
Int. Cl. F16l *1/00*
U.S. Cl. 29—429 **15 Claims**



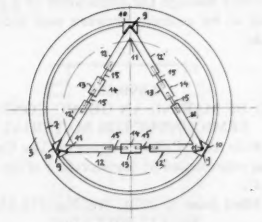
1. In the construction of a pipeline, a method for pressurizing the interior of the pipeline which comprises providing a selectively sealed chamber within the pipeline, directing a pressure fluid into the chamber for providing a preselected pressure therein, enlarging the chamber within the pipeline during the construction thereof, maintaining the pressure within the chamber at said predetermined level during the enlarging thereof throughout the pipeline construction operation, and utilizing said pressure for applying axial tension to the pipeline.

3,890,694

DEVICE FACILITATING THE POSITIONING OF A PIPE COUPLING

Gilbert Pineur, Avenue A. Sonck 3, 4280 Hannut, Belgium

Filed May 1, 1974, Ser. No. 466,075
Claims priority, application Belgium, May 4, 1973, 799088
Int. Cl. B23p *11/02*
U.S. Cl. 29—450 **5 Claims**



1. A device for positioning a single-unit pipe coupling onto pipes and for positioning pipes into a coupling, characterised in that it is composed of at least three plates of metal or of other hard material such as wood, the thickness of which is slightly less than the width of a median groove in the coupling in which an expansion joint or seal is seated, and the surface area of which is sufficient to ensure that, while being positioned inside the groove, they extend beyond the internal diameter of the pipes to be coupled together, these plates being fixed to corner pieces having two arms, generally of metal, and identical in number to the plates, the magnitude of the angle inscribed inside the two arms of said corner pieces being determined in such a way that it is possible to align one arm of one corner piece with one arm of an adjacent corner piece, and is further composed of means enabling an extension and a contraction to be exerted in succession and progressively on each of the arms of mutually aligned corner pieces, such means enabling one of said arms to be progressively separated from the other at the time of positioning of the plates in the groove of the coupling and conversely enabling said arms to be progressively brought together in order to withdraw the plates from the groove of the coupling.

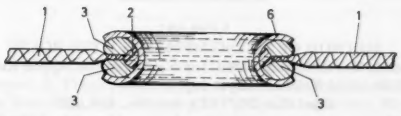
5. A method of coupling together pipes of diameter exceeding 45 cm by means of the device of claim 1, characterised in that, after the diameter of the circle within which the external edge of the plates is inscribed has been reduced to a value slightly less than the smallest internal diameter of the coupling, these plates are positioned opposite to the groove of the coupling, each corner piece is successively and progressively moved apart so as to introduce the plates into the groove, the coupling is driven onto the first pipe, the device is held in position, the second pipe is driven into the coupling, and each corner piece is successively and progressively brought together in such a way as to reduce the diameter of the circle within which the external edge of the plates is inscribed to a value slightly less than the internal diameter of the pipes.

3,890,695

METHOD OF INSERTING A GRUMMET OR THIMBLE IN SAIL CLOTH OR THE LIKE

Douwe Gaastra, Heeg, Netherlands, assignor to Gaastra B.V., Sneek, Netherlands

Filed Apr. 16, 1973, Ser. No. 351,481
Claims priority, application Netherlands, May 8, 1972, 7206211
Int. Cl. B23p *3/00, 25/10*
U.S. Cl. 29—458 **2 Claims**

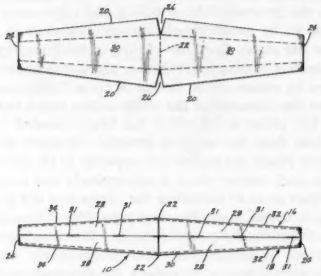


1. A method for inserting a grummet or thimble in a material, such as sail cloth or the like, comprising the steps of
forming an opening in said material;
ravelling the edge of said opening;
smearing said raveled edge with a thermosetting adhesive to form a thickened edge about the opening;
positioning a first ring on a tube having a flared end and an unflared end so that said first ring comes to rest on said flared end;
inserting the unflared end of said tube into said opening so that said unflared end projects therethrough and said first ring is placed in contact with one side of said material against the thickened edge of said opening;
positioning a second ring on said projecting end of said tube so that said second ring is in contact with the other side of said material against the thickened edge of said opening;
and deforming the ends of said tube so that said tube assumes a torus-shaped configuration to tightly clamp the adhesive-smeared thickened edge of said opening between said first and second rings.

3,890,696
TOW TRUCK BOOM AND METHOD OF CONSTRUCTING SAME

Earl R. Buske, 206 Fourth Ave., Pocahontas, Iowa 50574

Filed May 10, 1973, Ser. No. 359,104
Int. Cl. B23k *31/06*
U.S. Cl. 228—173 5 Claims



1. Method of constructing a boom having a cross sectional area that increases from the opposite ends towards the center comprising the steps of,

providing a pair of channel-shaped members in face-to-face relationship wherein each channel member includes side walls which increase in height from the outer ends of the members towards the center and a V-shaped notch is provided at the center of each side wall, said notch having its vertex at the base of the channel,

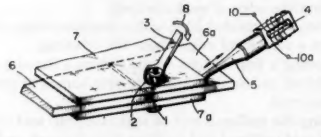
bending of the base of each of said members along a fold line extending across the base of each member and through the vertexes of said V-shaped notches to bring said members into engagement along the edges of their adjacent side walls, and

bonding together the adjacent edges of said members.

3,890,697
METHOD OF FIXING MEMBERS WITH BOLTS

Masaki Horioka, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1973, Ser. No. 409,683
Claims priority, application Japan, Oct. 25, 1972, 47-106167
Int. Cl. B23p *19/00*
U.S. Cl. 29—526 8 Claims



1. A method of securing at least two members together with at least one threaded bolt, comprising:

placing said at least two members together with respective surfaces thereof in contact with each other;

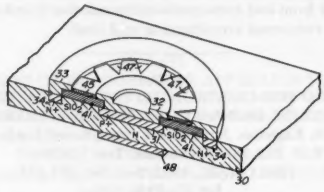
threadably fastening said members together with a threaded bolt which passes through at least one of said members; and

applying vibratory energy to at least one of said members jointly with the tightening of said threaded bolt.

3,890,698
FIELD SHAPING LAYER FOR HIGH VOLTAGE SEMICONDUCTORS

Lowell E. Clark, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 194,380, Nov. 1, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,377
Int. Cl. B01j *17/00*
U.S. Cl. 29—577 4 Claims



1. A method for increasing the breakdown voltage of a semiconductor device having

a first region of a first conductivity type having an upper surface,

a second region of a second conductivity type located in said first region and in contact with said upper surface thereof,

a third region of a higher doping concentration of said first conductivity type located in said first region in contact with said upper surface thereof and spaced from said second region,

a first conductive terminal making an ohmic contact with said first region,

a second conductive terminal having an outer boundary having a curved portion and making an ohmic contact with said second region, and

a third conductive terminal located outside said second conductive terminal and making an ohmic contact with said third region, said third conductive terminal having an inner boundary having a curved portion and being spaced apart from said second conductive terminal forming a space between said respective curved portions thereof, said method comprising the steps of:

applying a resistive material to said space between said respective curved portions thus making contact with said second and third terminals and forming a series of higher resistivity areas and lower resistivity areas in said resistive material with the higher resistivity areas being concentrated adjacent said third terminal to cause the electric field created through the application of a voltage to said terminals to be uniform between said second and third terminals.

3,890,699
METHOD OF MAKING AN OHMIC CONTACT TO A SEMICONDUCTOR MATERIAL

Juri Vilms, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,250
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—590 2 Claims

1. Method of making an ohmic contact to N-type gallium arsenide including the steps of

a. depositing a layer of gold on the gallium arsenide surface, a layer of silver on said gold layer, said silver layer being at least 0.080 microns thick, and a layer of germanium on said silver layer wherein the three layer structure has the composition about 25 to 35 weight percent gold, about 35 to 45 weight percent silver and about 25 to 30 weight percent germanium, and

b. alloying the three layer structure in an inert atmosphere and at a temperature in the range of 460° to 490°C for 1 to 10 minutes.

3,890,700

METHOD FOR THE MANUFACTURE OF A COMPOSITE WIRE WITH AN ALUMINUM CORE AND NIOBIUM CLADDING

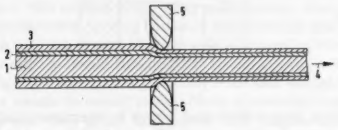
Heinrich Diepers, Erlangen-Bruck; Horst Müsebeck, Erlangen, and Eduard Wirkner, Furth, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 12, 1973, Ser. No. 378,423

Claims priority, application Germany, Aug. 3, 1972, 2238293

Int. Cl. H01v *11/14*

U.S. Cl. 29—599 11 Claims



1. A low temperature method for manufacturing a composite wire having an aluminum core clad with niobium without subjecting the composite wire to any temperature above about 100°C., said method comprising the steps of

a. forming an aluminum rod;

b. covering said rod with a niobium jacket to form a starting structure;

c. applying a drawing aid to the outside of said jacket;

d. repetitively cold-drawing the starting structure until a intimate mechanical bond between the aluminum and niobium is achieved;

e. removing said drawing aid from said jacket; and

f. subjecting the resulting structure to a surface-smoothing cold-forming process.

3,890,701

PROCESS FOR THE PRODUCTION OF A COMPOSITE WIRE HAVING AN ALUMINUM CORE AND A NIOBIUM COVER

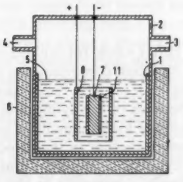
Heinrich Diepers, Erlangen-Bruck, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 13, 1974, Ser. No. 478,962

Claims priority, application Germany, June 22, 1973, 2331925

Int. Cl. H01v *11/14*

U.S. Cl. 29—599 5 Claims



1. In a low temperature process for producing a composite wire having an aluminum core and niobium case surrounding the core without submitting the composite wire to any temperature above about 100°C., in which process an initial rod is produced from a rod-like aluminum core with a niobium case surrounding the core after which the initial rod is reduced in cross section by a plurality of cold drawing steps, with a drawing aid applied to and surrounding the niobium case, thereby obtaining an intimate mechanical bond between the niobium and aluminum, with the final step comprising a surface smoothing cold deformation carried out after removal of the drawing aid, an improved process for forming the initial rod for use in making the composite rod comprising:

a. coating a carrier with a niobium layer by fusion electrolysis to form a cylindrical case of niobium over the carrier;

b. removing the carrier to leave only the niobium case; and

c. pushing an aluminum rod of suitable diameter inside the niobium case.

3,890,702

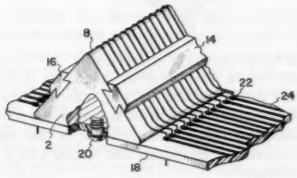
METHOD OF MAKING THERMAL RECORDING PRINT HEAD

Charles E. Lane, III, Meadowbrook, Pa., assignor to Honeywell, Inc., Minneapolis, Minn.

Division of Ser. No. 457,622, April 3, 1974. This application July 22, 1974, Ser. No. 490,230

Int. Cl. H05b *3/00*

U.S. Cl. 29—611 3 Claims



1. A method of manufacturing a print head comprising the steps of winding a single layer of spaced turns of a wire on an electrically resistive support mandrel having a longitudinal wire support edge and an undercut groove in each face of said mandrel adjacent to said support edge, filling said grooves in said mandrel and encompassing adjacent ones of said wires with a wire retaining compound and cutting said winding of wire along a predetermined longitudinal line on said mandrel.

3,890,703

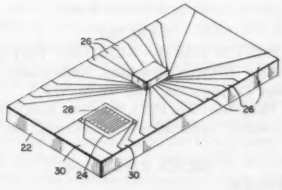
METHOD OF MAKING HUMIDITY SENSOR

Lawrence E. Frazee, Huntington, N.Y., and Anthony V. Fraioli, Essexfells, N.J., assignors to Plessey Incorporated, Melville, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,436

Int. Cl. H01c *1/14, 17/00*

U.S. Cl. 29—621 5 Claims



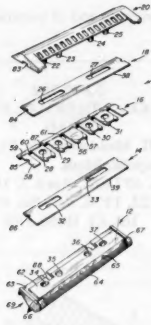
4. In the method of producing a humidity sensor by firing a layer of a cobalt oxide paste onto a high-temperature resistant, dielectric substrate to produce a hygroscopic element, the improvement comprising firing said element a second time for a short period at a temperature of about 1500°C. in a reducing atmosphere, whereby the resistivity of said element is lowered.

3,890,704

RAZOR BLADE CARTRIDGE

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Co., Morris Plains, N.J.

Filed Jan. 14, 1974, Ser. No. 433,030
Int. Cl.[2] B26B *21/06, 21/22*
U.S. Cl. 30—47 5 Claims



1. A razor blade cartridge comprising:

a. a plastic blade seat member including a transversely elongated guard surface defining a front surface of said blade seat member, and at least two transversely spaced perforations therethrough, each one of said perforations being transversely elongated and having a first longitudinal dimension;

b. a first blade located on said blade seat member including a forward cutting edge spaced upwardly and rearwardly of said guard surface, and at least two transversely spaced apertures, each one of said first blade apertures being transversely elongated and having a second longitudinal dimension greater than said first dimension;

c. a spacer member located on said first blade including at least two transversely spaced holes;

d. a second blade located on said spacer member including a forward cutting edge spaced upwardly and rearwardly of the forward cutting edge of said first blade, and at least two transversely spaced apertures, each one of said second blade apertures being transversely elongated and having a third longitudinal dimension greater than said second dimension; and

e. a cap member located above said second blade and including at least two plastic posts extending downwardly through said apertures, said holes and said perforations, said posts initially having a longitudinal outer dimension equal to or greater than the longitudinal dimensions of said apertures and said perforations to provide a longitudinal interference fit of said posts in said apertures and said perforations.

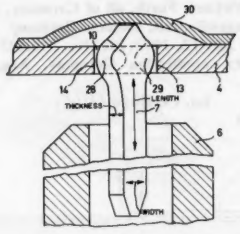
3,890,705

COUPLING PIN FOR AN ELECTRIC DRY-SHAVER

Eduard Willem Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,115
Claims priority, application Netherlands, Dec. 22, 1972, 7217486
Int. Cl. B26b *19/14*
U.S. Cl. 30—43.6 5 Claims

1. In a shaving head of a rotary dry shaver including a shear plate tiltably mounted within a housing, a rotatably cutter positioned for engaging said shear plate, drive means for imparting rotary motion, a coupling member having a first part engaged and driven by said drive means and a drive end formed as a coupling pin for engaging and driving said cutter, and spring means engaging and urging said coupling pin axially against said cutter which is correspondingly urged axially against said shear plate, the improvement in combination therewith wherein said cutter has defined therein a central, rectangular aperture defining a pair of long side-walls and a pair of side-walls for receiving said coupling pin, and said coupling pin is formed of sheet material and comprises a shank having length and width in the plane of the sheet and



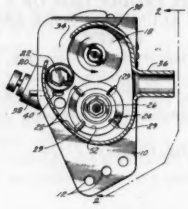
thickness, and a drive end which is insertable axially within said aperture and has a pair of ears which extend in the opposite directions widthwise, each bar having a rounded outer edge of radius substantially equal to one-half of the length of one of said long walls, each ear also curved out of the plane of said sheet about a lengthwise axis, with the outer surface of each ear having a radius about said axis substantially equal to one-half the length of one of said shorter walls.

3,890,706

ROVING CUTTER FOR FIBER REINFORCED SYNTHETIC RESIN SPRAYERS

Jay Johnson, 5350 Jessen Dr., LaCanada, Calif. 91011

Filed Aug. 24, 1973, Ser. No. 391,208
Int. Cl. B26b *17/00*
U.S. Cl. 30—180 2 Claims

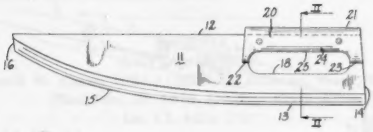


1. An improved cutter wheel for use in a cutter for chopping rovings of fibrous material, comprising an elongated cylindrical member having at least one radial slot extending transversely between the ends of the cylindrical member, said slot having a convex surface longitudinally in an arc over at least a portion of the length thereof in the direction of the axis of revolution of the cylindrical member, and a cutter blade of straight spring material positioned in the slot and having a sharp cutting edge along one elongated edge projecting radially outwardly from the cylindrical member, the width of the slot being greater than the thickness of the blade, the blade being held in a flexed curved shape against said convex surface when inserted in the slot by bending the blade, the blade being locked in the slot merely by the straightening action of the spring blade producing a lateral force pressing the center portion of the blade against said convex surface and the ends of the blade against the opposite surface of the slot.

3,890,707
KITCHEN KNIFE

Henry V. Cremonese, 261 W. 11th St., New York, N.Y. 10014

Filed Jan. 3, 1974, Ser. No. 430,541
Int. Cl. B25g 3/00
U.S. Cl. 30—340 8 Claims

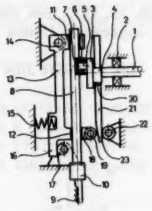


1. A knife comprising an elongated blade having an upper edge and a lower cutting edge, a front portion and a widened rear portion, the cutting edge being substantially straight in said rear portion and curving convexly therefrom to said front portion, an opening in said blade in said rear portion between said upper edge and said substantially straight portion of said cutting edge and substantially directly over said straight portion, and a handle mounted to said blade above said opening, whereby a user may grasp said handle with fingers received through said opening.

3,890,708
COMPASS SAW

Friedrich Bauer, Wolfschulgen, Germany, assignor to Metabowerke KG Closs, Rauch, & Schnitzler, Nurtingen, Germany

Filed July 18, 1973, Ser. No. 380,165
Claims priority, application Germany, July 21, 1972, 2235882
Int. Cl. B27b 19/02
U.S. Cl. 30—393 13 Claims

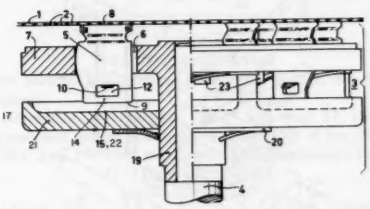


1. A compass saw comprising a housing; a drive shaft rotatably mounted in said housing and having eccentric means; an elongated rod connected to said eccentric means to be reciprocated thereby; a saw blade fixed to one end of said rod for reciprocation therewith; rocking means mounted in said housing for pivoting movement about a pivot axis and guiding said rod for reciprocation in longitudinal direction; means in said housing for counterbalancing the mass forces produced by the movement of said rod and said saw blade connected thereto, said counterbalancing means comprising an eccentric on said drive shaft and an elongated balancing body extending substantially parallel to said rod and being reciprocated by said eccentric in opposition to the movement of said rod, said balancing body having spaced from said eccentric a free end, and on one side thereof between said eccentric and said free end, a face inclined to the direction of its elongation; engaging means on said rocking means engaging said inclined face of said balancing body for causing said rocking means to pivot about said pivot axis during reciprocating movement of said rod and said saw blade connected thereto; and means in said housing cooperating with said rocking means for adjusting the pivoting movement the latter performs about said pivoting axis.

3,890,709
ROTATABLE CUTTER HEAD FOR AN ELECTRIC DRY SHAVER

Eduard Willem Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,069
Claims priority, application Netherlands, Jan. 12, 1973, 7300454
Int. Cl. B26b 19/14
U.S. Cl. 30—43.6 9 Claims



1. In an electric dry shaver including a perforated shear plate, the improvement comprising a rotatable cutter head including a support member having top and bottom surfaces, being rotatable about a central axis, and including a plurality of slots extending therethrough with corresponding top and bottom parts, a plurality of cutters each being situated in one of said slots, means for rotating said support member, each cutter having a central part in said slot, a top part extending above the top of said slot and terminating in a cutting edge for engaging said shear plate, and a bottom part extending below the bottom of said slot with an aperture in said bottom part of said cutter transverse of said slot, and spring means secured to the said support member and having a resilient finger extending at least partially across the bottom of each slot and having diameter smaller than said aperture in the cutter, said finger when a cutter is inserted downward through each slot, initially blocking the cutter's bottom part from extending through the bottom of the slot, said spring being deflectable when the cutter is urged further downward until said finger springs through said aperture, said finger then positioned while traversing said aperture and being deflected, to alone resiliently urge the cutter upward.

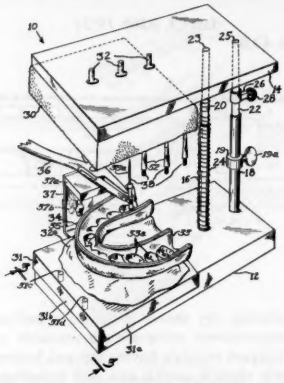
3,890,710
DENTAL DOWEL PIN POSITIONING AND ALIGNING APPARATUS

Charles G. Jaeger, 1340 N. Pike Lake Ct., Minneapolis, Minn. 55112

Filed Apr. 12, 1974, Ser. No. 460,385
Int. Cl. A61c 13/00
U.S. Cl. 32—11 11 Claims

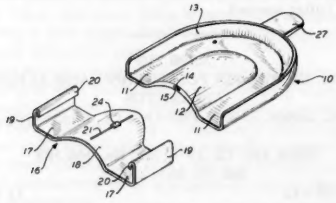
1. A dowel pin holding and aligning apparatus for aligning and retaining dowel pins in selected positions during a dental casting operation in making a positive replica of a tooth from a negative impression which is formed in an impression material, said apparatus comprising a supporting base, said base being adapted to support a dental tray for a dental impression in which the dowel pins are to be placed, a temporary dowel pin holder above said portion of the base adapted to support the tray, the temporary dowel pin holder comprising a deformable retaining material having a pierceable surface within which the dowel pins remain temporarily once they are embedded therein, a slidable mounting element supporting the temporary retainer on the base such that the temporary retaining element can be moved with respect to the base and tray along an axis parallel to the axis of the pins and parallel to the longitudinal axis of the negative impression of the teeth within which the pins are to be located, that is to say substantially normal to the plane of the tray on the base, each dowel pin including a needle-like piercing element, whereby during use

each pin can be placed in desired locations within a tooth impression in the tray, relative sliding motion can then be established between the base and the temporary retainer while the dowel pin is held in position within its tooth impression thereby forcing the dowel pin into the deformable retaining material which then holds the dowel pin in place and locates each of said dowel pins a selected distance above the lower



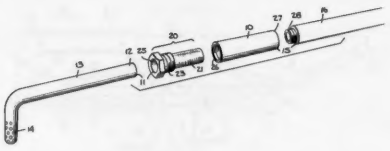
end of its tooth impression thereafter while each additional successive pin is embedded one after another in the temporary retaining element until all of the pins have been properly located and the retainer being then movable to a position in which all of the pins are simultaneously transferred to their original positions within the negative tooth impressions of the tray for the casting of stone around the end of the pins within the negative tooth impressions.

3,890,711
ADJUSTABLE DENTAL IMPRESSION TRAY
William F. Burns, 21 Brooklawn, Pompton Plains, N.J. 07444
Filed Apr. 18, 1974, Ser. No. 461,885
Int. Cl. A61c 9/00
U.S. Cl. 32—17 **2 Claims**



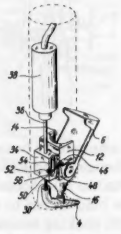
1. An adjustable dental impression tray including a primary impression unit, an extension unit telescopically mounted on said primary unit for adjustment relative thereto in proximal and distal directions, and releasable means for securing said primary and said extension units in their adjusted position; said primary unit being provided with an elongated longitudinally extending securing means retaining slot of T-shaped cross-section in open communication with the distal end and with one face thereof, said extension unit being provided with an elongated slot in juxtaposition to the said T-slot of said primary unit and in communication therewith; said securing means comprising a mounting head slidably retained within the T-slot of said primary unit, a threaded stem affixed to said head and extending through and beyond both of said elongated slots, a clamp nut threadably engaged with the extending portion of said stem, and a retainer head affixed to the projecting end of said stem for preventing disassembly of said securing means.

3,890,712
SALIVA EJECTOR
Oscar Lopez, 50 Edgewater Rd., Cliffside Park, N.J. 07010
Filed Aug. 29, 1973, Ser. No. 392,424
Int. Cl. A61c 17/04
U.S. Cl. 32—33 **9 Claims**



1. An improved saliva ejector comprising:
a pliable semi-rigid tubular end piece being open at one end and defining a perforate closure at the other end;
a strainer unit of integral construction adapted to receive, in friction fit, said tubular end piece;
first connecting means to secure said strainer unit to a suction tube;
said strainer unit including a head which defines an orifice dimensioned to frictionally receive said tubular end piece, an elongated cylindrical strainer open at one end to communicate with said orifice and closed at its other end and an intermediate section disposed between said head and said strainer with externally threaded second connecting means for securing said strainer unit to said first connecting means, said strainer having an exterior diameter less than the interior diameter of said first connecting means to provide an annular space therebetween.

3,890,713
DENTAL DEVICES
Nils Villadsen Nielsen, Sdr. Hallundbaek, Hodsager, Holstebro, Denmark
Filed Sept. 25, 1973, Ser. No. 400,654
Claims priority, application United Kingdom, Sept. 27, 1972, 44594/72
Int. Cl. A61c 5/04
U.S. Cl. 32—60 **15 Claims**



1. A dental implement for use in connection with filling of tooth cavities with a tooth filling material, comprising: a housing means, an outlet means provided on said housing means including an outlet spout provided with a central outlet passage having an outlet opening, a side opening provided in said outlet spout and communicating with said central outlet passage, a reciprocably mounted plunger means disposed in said central outlet passage, said plunger means being reciprocable between a retracted position uncovering said side opening and an advanced position covering said side opening, said plunger means including an outer end portion which is situated adjacent the outlet opening of said outlet passage when said plunger means is in said advanced position, a removable cartridge means for holding the tooth filling material, means mounted on said housing means for receiving said cartridge means, means disposed in said housing at said cartridge re-

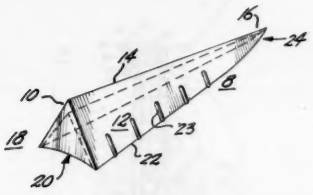
ceiving means for holding said cartridge means therein, and a power driven vibrator means connected to said plunger means for reciprocating the same in said central outlet passage, a connector conduit means disposed between said cartridge means and said side opening for guiding the filling material from said container means to said outlet opening whereby the filling material is dispensed through the outlet opening into the cavity and compressed therein.

3,890,714

DENTAL WEDGE

Kenneth W. Gores, 1026 112th N.E., Bellevue, Wash. 98004

Filed Nov. 29, 1973, Ser. No. 419,954
Int. Cl. A61c 3/00
U.S. Cl. 32—64 3 Claims



1. A wedge for pressing the lower portion of a dental contour band to a tooth encircled thereby, comprising:

pliable means forming an elongated trihedron-like resilient body having an apex and an open side opposite thereto; said apex being formed by the junction of common edges of an angularly flaired pair of vee-joined, thin, triangular walls;

each of said walls, in cross-section, tapering from said junction to its opposite edge; and

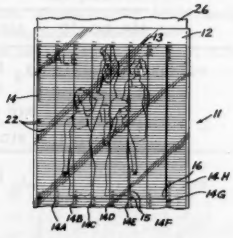
a third wall fully closed the space between said paired walls adjacent the larger end of the open-side of said body said third wall providing a resilient resistance to collapse of said paired walls.

3,890,715

DEVICE FOR MEASURING ADVERTISING SPACE

Arthur R. Kaplan, 20 E. Delaware, Chicago, Ill. 60611

Filed Aug. 27, 1973, Ser. No. 392,075
Int. Cl. G01b 5/26; G06g 1/00
U.S. Cl. 33—1 B 4 Claims



1. A device for measuring the area of a newspaper ad upon superimposing the device on the ad comprising

a transparent sheet,

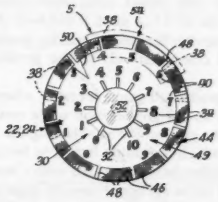
a series of parallel column lines spaced equally from each other defining newspaper columns, the left one of said column lines being used for locating the sheet along the left side of the ad and another one of said column lines being used for the right-hand boundary of said ad, an upper marginal line on said sheet perpendicular to said column lines to define an upper locating line for locating at the top of the ad, a series of parallel, transverse lines extending perpendicularly to said column lines and being spaced uniformly from each other, said column lines and transverse lines defining a grid work of areas, and indicia in said areas indicating the multiplication product of the transverse lines and number of columns thereby providing an area measurement at the lower right-hand area on said sheet superimposed over the lower right-hand corner of the ad, said transverse lines being spaced at whole number multiples of 1/14th of an inch to provide an area measurement in agate lines.

3,890,716

VERNIER INDICATOR

Donald Hatch, 10 Whaley Ln. Whaley Bridge, Stockport, England

Continuation-in-part of Ser. No. 67,342, Aug. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 791,901, Jan. 17, 1969, abandoned. This application Oct. 9, 1973, Ser. No. 404,594
Int. Cl. G01d 3/10
U.S. Cl. 33—1 D 24 Claims



1. A circular vernier indicator of hand manipulatable dimensions and of an outer diameter of within the range of hand gripping, comprising

a lower dial member and an upper dial member rotatable relative to one another about a common axis and having upwardly directed dial faces transverse to the axis and positioned in operable relative axial proximity, and having physical characteristics such as to enable visual observation of the scales, referred to below, on both dial faces in direction from upwardly of the dial members,

a. one of the dial members having a circular normal scale on its dial face adjacent the axis with radial indicating elements angularly spaced and distributed circumferentially,

b. the dial member other than in (a) having an indexing element positioned generally radially outwardly of the normal scale and having a radially inwardly directed point adjacent the normal scale and cooperable with that scale,

c. one of the dial members having a circular second scale on its dial face adjacent its periphery and spaced radially further from the axis than the normal scale and having indicating elements distributed circumferentially at the same angular spacing of the normal scale and thereby constituting an expanded scale relative thereto, the second scale being made up of elements so dimensioned and proportioned that the indicating elements therein are of circumferential dimension similar to that of the indicating elements of the normal scale, and portions between the indicating elements of much greater circumferential dimension than the indicating elements and effectively obstructing visual comparison between the second scale and the vernier scale referred to below, and

d. the dial member other than in (c) having a circular third scale on its dial face with indicating elements distributed circumferentially and angularly spaced dissimilarly to those of the second scale and thus constituting a vernier scale, but also having portions between the indicating

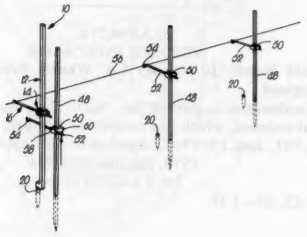
elements of much greater circumferential extent than the indicating elements and of nonindicating character.

3,890,717

DEVICE FOR SETTING GRADING LINES

Russell W. Haun, 10205 Newton, Kansas City, Mo. 64134

Filed May 8, 1974, Ser. No. 467,888
Int. Cl. G01c *15/00*
U.S. Cl. 33—86 **11 Claims**



1. A gauging device for use in setting grading lines while being positioned completely above the ground, said device comprising:

an elongated, graduated gauge member adapted to be manually held in an upright position while resting atop a hub driven into the ground for establishing the location above said hub at which a grading line is to be supported,

said gauge member being provided with a lower end having a horizontal cross-sectional area at least as large as the horizontal cross-sectional area of the remainder of the gauge member, means secured to said lower end projecting laterally therefrom and point means carried by and projecting dowardly from said laterally projecting means for engaging the top of said hub;

an indicator member shiftable longitudinally on said gauge member for disposition at a predetermined height on the gauge member in registration with a graduation corresponding to said height;

a line holder member carried by said indicator member and projecting laterally outwardly from said gauge member for temporarily supporting the line at said predetermined height and at a predetermined horizontal distance from said hub; and

a level on one of said members for trueing the device.

3,890,718

METHOD FOR DETERMINING ASTRONOMIC NORTH BY GYROCOMPASS

Leslie F. Gregerson, and Gordon R. Symonds, both of Ottawa, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed July 27, 1973, Ser. No. 383,117
Claims priority, application Canada, July 27, 1972, 148083
Int. Cl. G01c *19/38*
U.S. Cl. 33—301 **7 Claims**

1. The method of determining North by gyrocompassing in which a gyrocompass having one degree of freedom has its rotor spin axis in the horizontal plane and is suspended by a filar band for oscillation about a vertical axis in the band as a torsion pendulum, which comprises:

observing and recording the times of transit of the spin axis while the rotor is spinning across a fixed point located close to the Meridional plane which includes and oscillation axis, and across a pair of fixed points located approximately equiangularly distant East and West from said Meridional plane;

observing and recording times of transit of the spin axis with the rotor non-spinning during a plurality of oscillatory swings across said fixed points;

establishing from said timing observations a mean period P_c and a mean period P_z respectively for said spinning and non-spinning swings;

establishing quasi-angular velocities ω_q of a Simple Harmonic Motion:

$$x = A.\sin\omega_q t$$

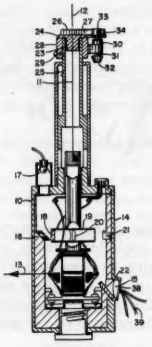
such that:

$$\omega_{qc} = 2\pi/P_c$$

and

$$\omega_{zq} = 2\pi/P_z$$

establishing from said time measurements the time intervals t_R and t_L defined by successive transits of the spin axis



across the Meridional and East pair of fixed points and across the Meridional and West pair of fixed points;

establishing the apparent offset distances of the near-Meridional fixed point from the equilibrium North direction represented by the differences from the half-period times $P_c/2$ and $P_z/2$ of the mean periods of swings East and West as respective time time intervals

t_C and t_c;

establishing the apparent amplitude A of said Simple Harmonic Motion as

$$A_c = \frac{1 + \dfrac{\sin \omega_q t_C - \sin \omega_q t_L}{\sin \omega_q t_R - \sin \omega_q t_C}}{\sin \omega_q t_L - \sin \omega_q t_R}$$

$$A_z = \frac{1 + \dfrac{\sin \omega_q t_c - \sin \omega_q t_L}{\sin \omega_q t_L - \sin \omega_q t_c}}{\sin \omega_q t_L - \sin \omega_q t_R}$$

deriving angular representations of the differences S between the equilibrium direction and the near-Meridional fixed point expressed as an angular distance in units of time interval t_R as

$$S_c = A_c \cdot \sin \omega_q t_C$$
$$S_z = A_z \cdot \sin \omega_q t_c$$

and establishing the true direction of North from the angular difference n between the direction determined by the fixed near-Meridional point and North as

$$n = [1 + k]S - kS_z$$

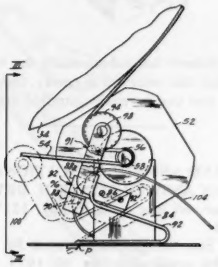
where k is the ratio of the torsion torque of the band to the torque τ due to the directive moment of Earth's centripetal force, derived from the periods of spinning and non-spinning swings as observed.

3,890,719

BROKEN BELT POWER-DISCONNECT SYSTEM FOR DRYERS

Albert T. Braga, Stevensville; Robert A. Brenner, St. Joseph, and Ralph S. Odle, Jr., Michigan City, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 25, 1974, Ser. No. 436,448
Int. Cl. F26b *19/00*
U.S. Cl. 34—55 **11 Claims**



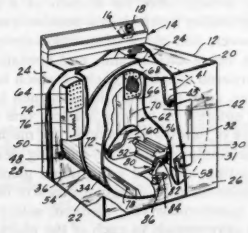
1. A clothes drying machine comprising:
a rotatable drum;
a drive motor;
a power lead for delivering power from a power source and electrically connected to said drive motor;
flexible drive means coupling said drive motor and said drum for rotating said drum when said drive motor is energized via said power lead; and
power-disconnect apparatus including
a separable connector in said power lead,
idler means in mechanical contact with and tensioning said flexible drive means, and
separating means mechanically interacting together with said idler means for separating said connector in response to loss of tension from said flexible drive means.

3,890,720

BROKEN BELT SWITCH CONTROL SYSTEM FOR CLOTHES DRYER

George V. Nichols, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 25, 1974, Ser. No. 436,545
Int. Cl. F26b *19/00*
U.S. Cl. 34—55 **7 Claims**



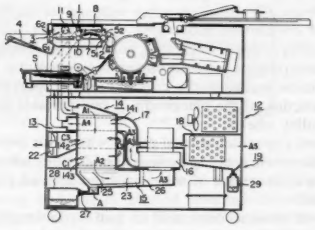
1. In a clothes dryer having a rotatable drum, heater means for drying clothes in the drum, a motor to rotate the drum, a belt connecting the motor and the drum for rotating the drum, tensioning means including a spring bracket and belt engagement means for applying tension to and held in an energy storing position by the belt, and an electrical circuit for connection to an electrical supply including the motor and the heater means, the improvement comprising:
means for preventing damage to the dryer and clothes therein on breaking of the belt, comprising a switch connected in the electrical circuit for controlling the energization of the motor, said switch including
a switch actuator mounted spaced from and in the path of movement of the spring bracket for direct contact by the spring bracket upon breaking of the belt and release of the energy stored in the bracket to open the circuit and interrupt energization of the motor.

3,890,721

DEVELOPING LIQUID RECOVERY DEVICE IN A COPYING MACHINE

Hajime Katayama; Koichi Miyamoto, both of Tokyo, and Shoji Ohashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1973, Ser. No. 426,054
Claims priority, application Japan, Dec. 26, 1972, 48-994; Apr. 17, 1973, 48-43493; June 4, 1973, 48-62737
Int. Cl. F26b *21/06*
U.S. Cl. 34—73 **12 Claims**



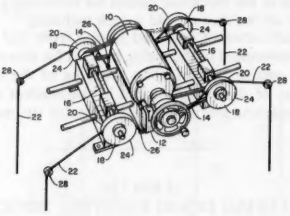
1. A developing liquid recovery device comprising:
a drying chamber which includes an inlet and an outlet for a copy medium and which is of substantially hermetically sealed construction, said drying chamber accommodating heating means for heating the copy medium bearing an image formed by wet-developing to dry the copy medium with developing liquid vapor produced from the copy medium;
a condenser chamber for accommodating means for cooling the developing liquid vapor produced in said drying chamber to form the vapor into mist;
a mist collector chamber for accommodating means for applying an electric field to the developing liquid vapor in the form of mist to collect the mist;
means for circulating an air flow through said drying chamber, said condenser chamber and said mist collector chamber in the order named; and
discharging means disposed downstream of said mist collector chamber and upstream of said drying chamber, said discharging means discharging a part of the air flow to maintain the pressure in said drying chamber at a lower value than that of the ambient pressure.

3,890,722

MOTION SIMULATOR

Daniel Nunez, 2326 Stafford Rd., Thousand Oaks, Calif. 91360

Filed Sept. 4, 1973, Ser. No. 394,024
Int. Cl. G09b 9/08
U.S. Cl. 35—12 P 18 Claims



1. A motion simulator system capable of motion in a plurality of degrees of freedom, comprising:

a platform;

a plurality of calibrated, variable-centered pulley wheels having means for adjusting the placement of a variable center of each said pulley wheel about which each said pulley wheel rotates;

a plurality of fixed points equal in number to said plurality of pulley wheels;

a plurality of means for supporting said platform, each said support means being connected between one said fixed point and said platform, each said support means mechanically communicating with and having the capability of continuous movement with respect to one of said pulley wheels, each said pulley wheel being capable of imparting a predetermined movement to the support means mechanically communicating therewith that is a function of the placement of said variable center of said pulley wheels;

means connected to said pulley wheels for imparting variable-speed, rotating motion to said pulley wheels about the variable center of said variable centered pulley wheels; and

power means connected to said variable-speed, rotating motion imparting means, whereby when said variable-speed, rotating motion imparting means is actuated for rotating said pulley wheels predetermined movements are imparted to said platform.

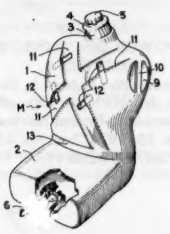
3,890,723

DUMMY, IN PARTICULAR FOR VEHICLE OR VEHICLE ACCESSORY TESTS

Edouard Haurat, Valentigney, and Roland Bouclet, Audincourt, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Feb. 4, 1974, Ser. No. 439,282
Claims priority, application France, Feb. 20, 1973, 73.05891
Int. Cl. G09b 23/00
U.S. Cl. 35—17 10 Claims

1. A dummy, in particular for carrying out tests on vehicles or automobile accessories, the dummy comprising an outer wall defining a cavity which constitutes a reservoir for a liquid, such as water, the wall defining outwardly an outer surface having substantially the shape and size of the trunk of a human body, the reservoir being closed except for the provision of reservoir filling means and reservoir emptying means and means for closing the emptying means, the filling means being in the upper part of the trunk and the emptying means in the lower part of the trunk in an upright position of the trunk and the cavity having a volume which is a major part of the volume defined by said outer surface of the wall whereby, when the reservoir is substantially filled with said liquid and the dummy



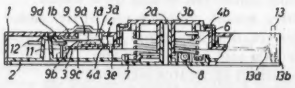
is in use, the dummy has substantially the weight of a human trunk and, when the reservoir is empty, the dummy is considerably lighter and can be easily handled and carried.

3,890,724

QUESTION AND ANSWER EDUCATIONAL GAME WITH AN ANSWER CONTROL DEVICE

Walter Hesener, 66 Rue de la Prulay, 1217 Meyrin-Geneva, Switzerland

Division of Ser. No. 129,469, March 30, 1971, Pat. No. 3,780,453. This application Oct. 10, 1973, Ser. No. 404,907
Claims priority, application Switzerland, Mar. 31, 1970, 4696/70; May 29, 1970, 8136/70; Sept. 5, 1970, 13300/70; Nov. 20, 1970, 17285/70; Nov. 30, 1970, 17659/70
Int. Cl. G09b 3/00
U.S. Cl. 35—48 R 14 Claims



1. A method of playing an educational game which game comprises a housing, a plurality of setting means adapted to be moved in a first direction relative to the housing into any one of at least two answer positions, each such answer position being representative of one of several possible answers to a given question and one of such answers being the correct answer, a code bearing means located in the housing and carrying a plurality of code elements, the code bearing means being movable in a second direction transverse to the first direction relative to the plurality of setting means, the code elements cooperating with the setting means so as to prevent relative movement therebetween in the second direction if any one of the setting means is in a position corresponding to an incorrect answer, and to permit relative movement therebetween in the second direction if each of a predetermined number of the setting means is in a position corresponding to a correct answer, and a set of question-carrying elements, each element being divided into and containing thereon a plurality of ordered questions each of which has at least one correct answer, each such question designed to have the answer thereto entered by moving a select one of said setting means into one of its answer positions, the method comprising the steps of: selecting one question-carrying element from said set for associating with said educational game; determining the answers believed to be correct for each of the questions on the selected question-carrying element; selecting the setting means which corresponds to each of the plurality of ordered questions on the selected question-carrying element, and entering each of said determined answers to the respective questions on the educational game by moving the selected one of the related setting means into the one of the at least two

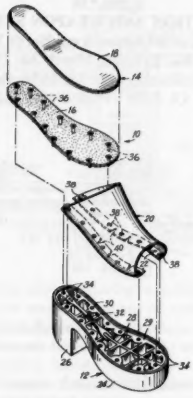
answer positions which corresponds to the determined answer to the question associated therewith.

3,890,725

SHOE CONSTRUCTION

Darrell Bernard Lea, Kogarah, Sydney, Australia, and Laszlo Klein, Hendon, London, England, assignors to Darrel Bernard Lea; Robert Phillips Marcus and Howard Lee Gilman, all of New York, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,344
Int. Cl. A43b 3/14
U.S. Cl. 36—11.5 **50 Claims**



1. A shoe construction comprising:

a sole unit having a plurality of first connectors spaced along the peripheral portion of the upper surface thereof; an insole positioned on the upper surface of said sole unit; an upper having edge portions positioned between said insole and the upper surface of said sole unit, said edge portions of said upper having a plurality of holes therethrough; and

a plurality of second connectors mounted on said insole, said second connectors extending through said holes in said edge portions of said upper into substantially permanent engagement with said first connectors to connect said insole and the edge portions of said upper to the upper surface of said sole unit;

each of said first connectors comprising a body portion having a plurality of downwardly and inwardly extending, flexible and resilient tabs defining a central opening therebetween, and each of said second connectors comprising a flange portion and a pin portion being adapted to be received within said central opening defined by said tabs of said first connector and being of a size greater than said central opening so as to be engaged by said tabs when inserted in said central opening.

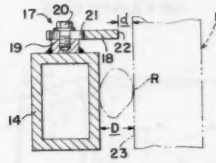
3,890,726

ROCK GUARD FOR SCRAPER DRAFT ARM

William T. Girard; Thomas R. Hamilton, and Bennett N. Waddell, all of Joliet, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Jan. 31, 1974, Ser. No. 438,286
Int. Cl. E02f 9/24
U.S. Cl. 37—124 **7 Claims**

1. In a tractor scraper combination having a scraper bowl pivotally attached to a tractor by a pair of laterally-spaced draft arms each positioned adjacent to a respective side of said scraper bowl, the invention comprising guard means attached on each of said draft arms to extend substantially the entire length thereof and each further extending between an upper surface of a respective draft arm and a respective side of said scraper bowl, and having inner edges thereof spaced a first



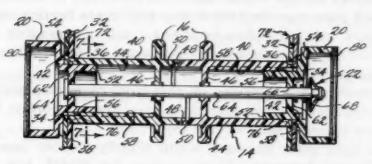
predetermined distance from a respective side of said scraper bowl which is substantially less than a second predetermined distance between each draft arm and the side of the scraper bowl.

3,890,727

ROTARY CARD FILE

Lloyd E. Rose, North Smithfield, R.I., assignor to Textron Inc., Providence, R.I.

Filed Aug. 23, 1973, Ser. No. 390,702
Int. Cl. G09f 11/02
U.S. Cl. 40—68.6 **13 Claims**



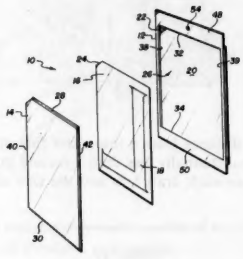
1. A rotary card file comprising a base structure including a pair of horizontally spaced vertically extending suppport elements having horizontally aligned openings therein defining rotary spindle supporting surfaces, said support elements having inwardly and outwardly facing annular spindle control surfaces adjacent said spindle supporting surfaces, a card supporting spindle structure extending horizontally between said support elements having means thereon for supporting a series of cards in articulated relation about the periphery thereof, said spindle structure including annular spindle control surfaces on the ends thereof interengaging the inwardly facing spindle control surfaces of said support elements, a pair of turning knob members disposed outward of said support elements, said turning knob members including annular spindle control surfaces on the inner ends thereof interengaging the outwardly facing spindle control surfaces of said support elements and shaft sections extending inwardly through said support element openings in supported relation with respect to the spindle supporting surfaces thereof, said spindle structure having recesses within the end portions thereof receiving said shaft sections, interengaging means between said shaft section and said recesses for permitting relative axial movement between said knob members and said spindle structure but preventing relative rotational movement between said knob members and said spindle structure when said shaft sections are disposed within said recesses, and means extending axially through said spindle structure and connected between said knob members for resiliently urging the latter axially toward each other and hence the interengaging spindle control surfaces into engagement, said resilient urging means including spring means for provding a desired balance between ease of turning and maintenance of the card carrying spindle in any position into which it is manually moved.

3,890,728

DISPLAY CHARACTER MODULE FOR CHANGEABLE COPYBOARDS

Wilfried Schubert, Bensenville, Ill., assignor to National Advertising Company, Bedford Park, Ill.

Filed Sept. 17, 1973, Ser. No. 398,074
Int. Cl. G09f *07/08*
U.S. Cl. 40—140 **7 Claims**



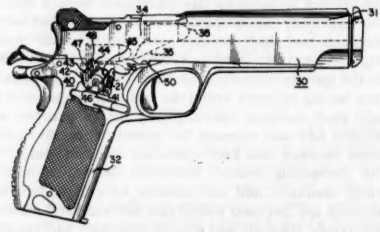
1. A display character module for changeable copyboards, said character module comprising:
   a front plate with a transparent image display portion defined within top, bottom and side portions of said front plate;
   an image bearing carrier sheet disposable adjacent said display portion within said front plate side portions;
   a back plate superimposable over said image bearing carrier sheet, said back plate including a pair of oppositely beveled edges for engaging said top and bottom portions of said front plate;
   a plurality of projections on said front plate side portions projecting inwardly over said image display portion from two opposite sides of said front plate;
   said back plate having a width slightly greater than the distance between said projections but slightly less than the distance between said two opposite sides of said front plate to enable a detachable locking engagement of said back plate and said projections; and
   mounting means on one of said plates for mounting said module on said changeable copyboard.

3,890,729

PROJECTILE OR CARTRIDGE INJECTOR FOR AUTOMATIC WEAPONS EMPLOYING MAGAZINES

David M. Frisoli, 2 Homestead Rd., Edison, N.J. 08817

Filed Oct. 9, 1973, Ser. No. 404,518
Int. Cl.² F41C *13/00, 25/02*
U.S. Cl. 42—7 **6 Claims**



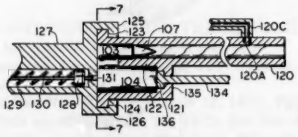
1. In an automatic firearm of the type employing a magazine for holding a number of stacked cartridges to be fired in succession, said magazine including a spring for forcing said cartridges toward a firing chamber of said firearm, said firearm exhibiting a movement from a recoil position to a rest position after a firing of one of said cartridges, in combination therewith apparatus for positioning those of said cartridges to be next fired for insertion into the firing chamber of said firearm during said movement from said recoil to said rest position, comprising:
   a. means activated by said movement and adapted to coact with a predetermined cartridge during said movement to force said one cartridge to assume an injection position necessary for proper insertion into said chamber, said means including a moveable arm capable of moving in a direction into said magazine for pushing said predetermined cartridge upwardly prior to injection of the cartridge into said firing chamber off said firearm.

3,890,730

AMMUNITION AND WEAPON SYSTEMS

Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 19038

Division of Ser. No. 239,595, March 30, 1972, Pat. No. 3,857,339. This application Feb. 21, 1974, Ser. No. 444,608
Int. Cl. F41c *11/00;* **F41f** *3/02*
U.S. Cl. 42—16 **25 Claims**



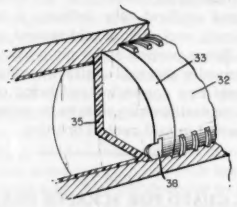
1. In a weapon system having a substantially cylindrical barrel and a capsule chamber integral therewith but laterally offset therefrom,
   longitudinally translatable breech means adapted to be rotated for securement in a locking position with said barrel and chamber, said breech means having a longitudinal passage for receiving a firing pin, said passage being in alignment with said chamber when said breech means is secured in locking position.

3,890,731

METHOD OF AND DEVICE FOR EXTRACTING CARTRIDGE CASES

Henry Wilhelm Aldrin, Degerfors, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Dec. 26, 1973, Ser. No. 427,597
Claims priority, application Sweden, Jan. 8, 1973, 7300177
Int. Cl. F41c *15/00*
U.S. Cl. 42—25 **3 Claims**



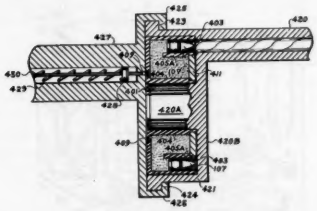
1. Apparatus for extracting a cartridge case formed of an elastic material from the chamber of a firearm comprising:
   a breech block,
   an obturating member in the form of a circular disc secured to the end of said breech block facing the chamber,
   said obturating member defining a recess at its periphery for receiving a part of the cartridge case as it is deformed in response to the pressure and heat generated at the time of firing,

whereby movement of said breech block with said obturating member secured thereto subsequent to firing results in removal of said cartridge case.

3,890,732
AMMUNITION AND WEAPON SYSTEMS

Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 19038

Division of Ser. No. 239,595, March 30, 1972, Pat. No. 3,857,339. This application Feb. 21, 1974, Ser. No. 444,441
Int. Cl. F41c *1/00*
U.S. Cl. 42—39.5 **5 Claims**



1. In a weapon system having a substantially cylindrical barrel and breech means rearward of said barrel, said barrel having a longitudinal axis along which a projectile is launchable,

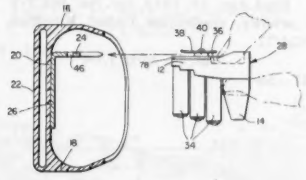
said breech means having a reciprocable firing pin, said firing pin having a longitudinal axis laterally offset from said barrel and barrel axis, and

a cylinder housing integral with said barrel and having an internal rearwardly extending substantially central stub.

3,890,733
HOLDER FOR REVOLVER LOADER

Paul P. Kubik, 304 Llewellyn Rd., Ambler, Pa. 19002

Filed Jan. 17, 1974, Ser. No. 434,132
Int. Cl. F42b *39/04*
U.S. Cl. 42—89 **12 Claims**



1. A holder for an ammunition loader comprising:

an open sided enclosure of a size and a configuration adapted to receive and at least partly surround an ammunition loader within the confines of said enclosure;

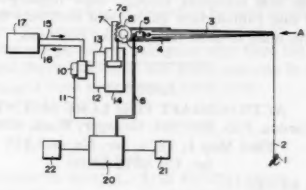
an engagable bracket member disposed within said enclosure and extending toward the open side thereof, said bracket member being positioned to securely receive the loader to permit the loader to be easily and quickly released; and

means to attach said holder to clothing accessories worn by an individual.

3,890,734
AUTOMATIC FISHING APPARATUS

Taneichi Kawai, Anjo, and Koji Nishida, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan

Filed Dec. 20, 1973, Ser. No. 426,961
Claims priority, application Japan, Dec. 22, 1972, 48-674
Int. Cl. A01k *97/00*
U.S. Cl. 43—4 **14 Claims**

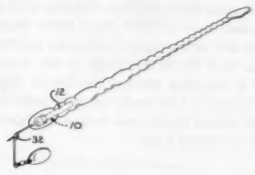


1. A device for detecting the pulling force on a fishing line when caused by a fish being hooked on the fishing line, comprising a housing, an element disposed in said housing and connected to said fishing line, said element being subjected to the pulling force of said fishing line, strain gauge means mounted on said element for detecting the strain of said element to thereby detect the pulling force on said fishing line, and sealing means sealing the inside of said housing containing said element and strain gauge means from the outside environment.

3,890,735
MECHANISM FOR FISHING LURE

Dehart M. Serrill, 1745 No. Main, Kansas City, Mo. 64116

Filed Aug. 20, 1973, Ser. No. 389,570
Int. Cl. A01k *83/02, 85/02*
U.S. Cl. 43—36 **7 Claims**



1. In a fishing lure comprising an elongated worm body of homogeneous soft plastic material, the improvement comprising:

an elongated tubular housing disposed in said worm body and surrounded by said plastic material,

said housing having at least three equally spaced peripheral openings in the sidewall thereof;

a rigid enlarged portion extending around said housing adjacent said openings and having an upwardly inclined edge presenting a cam surface extending to each of said openings;

at least three elongated spring steel members normally disposed in retracted positions in said housing and adapted to move through said openings to extended fish-catching positions projecting from said worm body and in frictional engagement with said cam surface,

each of said members having an end disposed on said cam surface in said retracted positions and characterized by a degree of spring bias against said cam surface to hold said members in said retracted positions,

each of said members being further characterized by a line of curvature at the point of frictional contact between the

member and said cam surface when the member is in its extended position whereby to project from said housing at an angle greater than the angle of inclination of the member in its retracted position within the housing; and attaching means coupled with the end of each of said members which is distal to said cam surface,

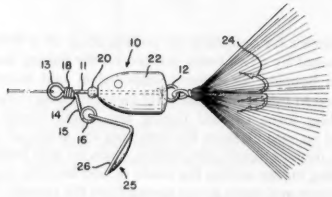
said attaching means accommodating limited movement of the members in any direction and being adapted to be secured to a fishing line whereby a sharp pull on the line slides said members through their respective openings and said cam surface guides said members through said worm body to their fish-catching positions.

3,890,736

ACTION-SHAFT FISH LURE MOUNT

R. B. Worden, P.O. Box 384, Granger, Wash. 98932

Filed May 1, 1974, Ser. No. 465,873
Int. Cl. A01k 85/00
U.S. Cl. 43—42.11 5 Claims



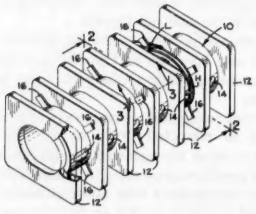
1. A fishing lure mount having a main body shaft of elongated wire and provided with forward and rearward loops lying in a common plane, an action shaft integrally connected to the main body shaft close behind said forward loop, said action shaft extending downwardly at a sharp angle from said main body shaft and terminating in an action loop, said action loop lying in the same plane as said forward and rearward loops, said action shaft having a relatively short length compared to said main body shaft so that the action loop lies close to said forward loop of said main body shaft, a bent blade connected to said action loop for limited oscillating movement whereby the bent blade transmits to the forward end of the lure mount a wiggling motion similar to that of a minnow wiggling, a buoyant lure body on said main body shaft rearward of said action shaft, and means for hooking a fish coupled to said rearward loop.

3,890,737

FISH HOOK RECEPTACLE

Boyd C. Jones, 750 Brahams Way, Sunnyvale, Calif. 94087

Filed Mar. 25, 1974, Ser. No. 454,325
Int. Cl. A01k 97/06
U.S. Cl. 43—57.5 R 4 Claims



1. A fish hook receptacle which comprises

a tubular member having a slot therein to accommodate the hook portion of the fish hook,

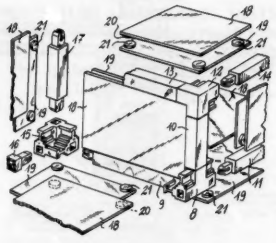
a flange projecting outwardly from said tubular member, and resilient means on the side of said flange for releasably receiving and holding the leader portion of said fish hook.

3,890,738

SET OF INTERCONNECTABLE PRESSURE ELEMENTS FOR MAKING CONSTRUCTION MODELS

Giancarlo Bassani, Brescia, Italy, assignor to Decio Maraglio, Clusone D'Iseo (Brescia), Italy

Filed Oct. 18, 1973, Ser. No. 407,441
Claims priority, application Italy, Nov. 30, 1972, 5240/72
Int. Cl. A63h 33/00
U.S. Cl. 46—16 3 Claims



1. A combination of pressure interconnectable construction elements comprising:

connectors;

elongated connecting rods; and

cover plates;

each said connector having at least two connection means angularly spaced from one another, and a recess formed on at least one side of each of said connection means;

each said rod having a connection means at each of its ends removably pressure fitted within said connector connection means; and

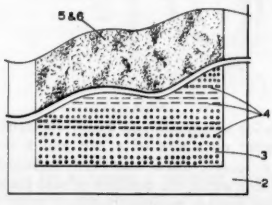
each of said plates having ridges projecting from at least one surface and adjacent the edges thereof, said ridges removably pressure fitted within the recesses in said connector.

3,890,739

METHODS OF PRODUCING GRASS CARPETS

Jack Blackburn, 103 Portland, Rd., Birmingham B 16 90 X, England

Filed Aug. 15, 1973, Ser. No. 388,379
Claims priority, application United Kingdom, Aug. 15, 1972, 37924/72
Int. Cl. A01c 1/04
U.S. Cl. 47—56 5 Claims



1. A method of producing a grass carpet comprising laying directly on a root impermeable surface a sheet of water impermeable material formed with a plurality of apertures, spreading grass seed and growing material such as soil, humus, compost, on top of the sheet, the size and shape of the apertures

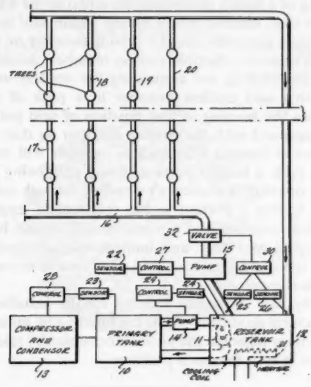
in the sheet being such that said seed and material is prevented from passing through the apertures, and applying water to the growing material.

3,890,740

FRUIT BUD RETARDING METHOD AND SYSTEM

Gary E. Miller, Salt Lake City, Utah, assignor to Technical Materials, Limited, Salt Lake City, Utah

Filed May 7, 1973, Ser. No. 357,574
Int. Cl. A01g 15/00
U.S. Cl. 47—58 13 Claims



1. A method of retarding budding of a fruit tree comprising the steps of:

maintaining a temperature immediately adjacent and encircling the exterior of the trunk below 38° F substantially independently of ambiant air temperature; and

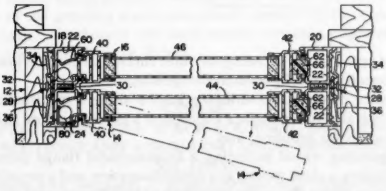
intermittently discontinuing maintainence whenever excessive moisture stress exists to permit the temperature to rise above 38° F in order to prevent excessive moisture stress and dehydration and damage to said tree.

3,890,741

DOUBLE HUNG PIVOTAL WINDOW

Waldo O. Johnson, Wooster, and Robert G. Buynak, North Canton, both of Ohio, assignors to Louisiana-Pacific Corporation, Portland, Oreg.

Filed Oct. 17, 1973, Ser. No. 407,207
Int. Cl. E05d 15/22
U.S. Cl. 49—162 2 Claims



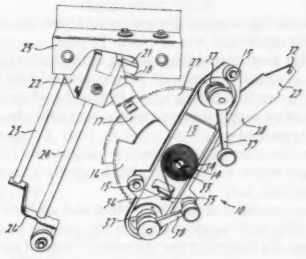
1. In a pivotally positioned double hung sash assembly including a jamb liner, a sash having one vertical edge portion slidably or operably engaging the jamb liner and means releasably engaging the opposite vertical edge of said sash for sliding movement, the improvement comprising said jamb liner including a laterally inwardly open channel section with overhanging flange members thereon, said sash including a laterally outwardly open channel section thereon with overhanging flange members thereon, a vertically extending connecting means extending between and engaging said channel sections for sliding movement of said sash in said jamb liner, said connecting means fixedly engaging said sash and having end flanged arcuate sections extending into said jamb liner to permit pivotal movement of said sash about said jamb liner, a second jamb liner for the opposite vertical edge of said sash, a resiliently positioned laterally movable guide strip protruding laterally from and carried by said sash to engage the second jamb liner, and a control means fixedly engaging an end portion of said guide strip and extending beyond an end of the sash whereby the control means can be twisted on a vertical axis to free the end portion of said guide strip from the second jamb liner and the remainder of said guide strip can be pogressively disengaged from such second jamb liner.

3,890,742

WINDOW REGULATOR MECHANISM

Floyd N. Ladd, Warren, and Donald G. Stacy, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1974, Ser. No. 457,534
Int. Cl.² E05F 11/44
U.S. Cl. 49—350 7 Claims



1. A window regulator mechanism adapted to lower or raise a window panel into or out of a window well,

the window panel being vertically divided into separately movable ventilation and visibility sections,

the window regulator mechanism comprising:

an elongated mounting plate,

a first gear sector freely rotatably mounted on a pivot shaft journalled in the mounting plate intermediate the ends of the latter,

a first regulator arm fixed to the first gear sector and coupled to the ventilation section for lowering and raising the latter in response to rotation of the first gear sector,

a second gear sector mounted on the pivot shaft and coupled to the latter for rotation therewith,

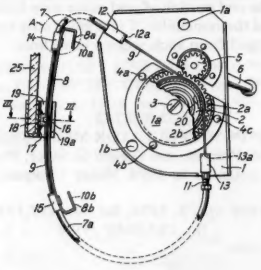
a second regulator arm fixed to the second gear sector and coupled to the visibility section for raising and lowering the latter in response to rotation of the second gear sector,

and independent first and second drive means located at opposite ends of the mounting plate and coupled to the first and second gear sectors, respectively, for rotating the latter to independently lower and raise the window panel sections.

3,890,743
VEHICLE WINDOW LIFTER

Wilhelm Eckhardt, Kolschhausen, and Klaus Küster, Ehringshausen, both of Germany, assignors to Küster & Co. GmbH, Germany

Filed Oct. 30, 1973, Ser. No. 411,160
Claims priority, application Germany, Nov. 10, 1972, 7241280
Int. Cl.² E05F 11/48
U.S. Cl. 49—352 **8 Claims**

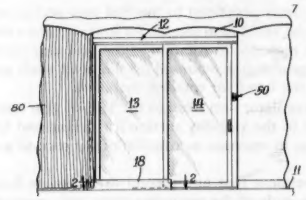


1. A window lifter for vehicles, comprising:
a. a base plate;
b. a drum rotatably mounted on said base plate;
c. a first and a second length of cable conduit, each fastened with one end to said base plate at substantially opposite sides;
d. a spacer bar inserted between said respective other ends of said conduits;
e. a cable loop closed by pressing a nipple over both cable ends of which a portion is wound around said drum; said cable extending through said first and said second length of conduit and traveling openly accessible in parallel to said spacer bar;
f. means for attaching the window pane to said cable hinged on said nipple where said cable is openly accessible along said spacer bar;
g. means provided at said base plate and said spacer bar for mounting said window lifter in the vehicle door; and
h. fittings for fastening the respective ends of said first and second length of cable conduit to said base plate and said spacer bar, said fittings consisting of a U-shaped sheet metal part provided with a bottom against which the conduit end rests and having tabs on one side for insertion into appropriate holes of the base plate.

3,890,744
PATIO DOOR OPERATOR

Martin A. Galis, Palatine, Ill., assignor to George Giambalvo, Winfield, Ill.

Filed Mar. 1, 1974, Ser. No. 447,097
Int. Cl.² E05F 15/14
U.S. Cl. 49—360 **6 Claims**

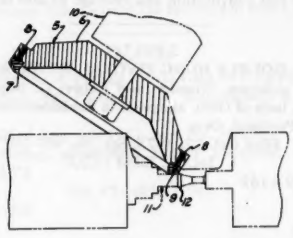


1. An apparatus for operating a sliding door unit of the type commonly referred to as a patio door used in a building wherein there is a floor at the bottom of the door unit immediately to one side of the door unit, said door unit being movable between a closed and an open position, and wherein there is a fixed similar unit at the opposite side of said door unit, said door unit having a first end thereof immediately adjacent said similar unit when said door unit is in the closed position and a second end remote from said similar unit when said door unit is in said closed position, said apparatus comprising:
a housing adapted to be mounted on said floor immediately at said one side of said door unit when said door unit is in the open position, said housing having an opening on the side thereof adjacent said door unit, said opening being of a length approximately equal to the width of said door unit, electric motor means within said housing and having a generally circular driving member on the output shaft thereof, a flexible endless member, means mounted on the housing and contacting the endless member for training said endless member in a path of movement within the housing, a first position of said path being in engagement with the driving member so that when said motor is running said endless member will move along said path, a second portion of said path being parallel to said opening, and means extending through said opening and having a portion within the housing engaging said endless member and a position outside said housing for engaging said door unit immediately adjacent said first end thereof for causing said door unit to move with said endless member,
whereby said apparatus can be readily installed without structural modifications to the building by mounting it on said floor adjacent the position occupied by said door unit when it is in the open position.

3,890,745
ANGLE DIAMOND GRINDING WHEEL

Anthony R. Geonnotti, 1500 Bridgewater Rd., Cornwells Heights, Pa. 19020

Filed Feb. 16, 1973, Ser. No. 332,921
Int. Cl. B24b 7/10, 19/00; B24d 7/18
U.S. Cl. 51—71 **4 Claims**



1. Apparatus for grinding an outer surface of carbide inserts to a specified configuration, comprising:
locator means for positioning inserts along a specified axis with said outer surface exposed at a predetermined orientation for grinding; and
a grinding wheel including a frustoconical flange portion having a shaft mount at a central location and a protuberance about the outer periphery of said flange, said protuberance having a generally triangular cross section tapering away from said outer periphery coaxially with said shaft, thereby defining outer and inner annular surfaces situated at predetermined acute angles to the plane of said outer periphery, the outer of said annular surfaces being formed with diamond abrasive surface to constitute a work surface, the angle of said outer annular surface to the plane of said outer periphery being in the range 15° to 55°;

said wheel rotating in a plane intersecting said axis at said angle of said outer annular surface to the plane of said outer periphery.

3,890,746
FLAPPER WHEEL

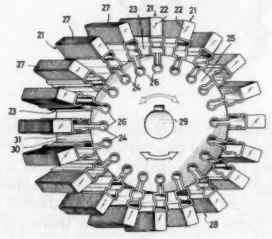
Kyuji Saegusa, 22-6, 2-chome, Shimomaruko, Ohta-ku, Tokyo; Eitetsu Sonobe, 35-132 Oaza Koizumi, Ageo-shi, Saitama-ken, and Susumu Sudo, 42-1, Sakae, Sakai-machi, Sawa-gun, Gunma-ken, all of Japan

Filed June 27, 1974, Ser. No. 483,848

Claims priority, application Japan, Sept. 7, 1973, 48-100812

Int. Cl. B24b *9/02*

U.S. Cl. 51—334 **10 Claims**



1. A flapper wheel comprising a rotary wheel member having a centrally positioned longitudinal axis, said wheel member having parallel planar sides, said wheel member having a plurality of segmental areas being divided by a plurality of longitudinal grooves circumferentially and equally spaced around its cylindrical surface, the longitudinal grooves being located parallel to the centrally positioned longitudinal axis of the rotary wheel member; a plurality of abrasive pad units, each of which being inserted into one of said longitudinal grooves, each of said abrasive pad units including multiple superimposed sheets of abrasive covered material, the planar surfaces of said superimposed abrasive sheets being arranged substantially parallel to the planar sides of the rotary wheel member, each of said superimposed sheets having an inner clamped end and an outer working end; a plurality of slidably mounted holder means, each of which clamps and maintains together the inner ends of said superimposed abrasive sheets in a laminar relationship to each other with said inner ends being substantially aligned, the outer working end of each of said superimposed abrasive sheets having an arcuate configuration, said arcuate working edges of said superimposed abrasive sheets being arranged substantially parallel to the direction of the grinding track operatively created by the contacts between a workpiece and said arcuate working edges of the superimposed abrasive sheets.

3,890,747
PREFABRICATED, SPACE-BOUNDING BUILDING SECTIONS AND A BUILDING MADE FROM SAID SECTIONS

Cornelis Van Der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Feb. 28, 1973, Ser. No. 336,732

Claims priority, application Switzerland, Feb. 28, 1972, 2541/72

Int. Cl. E04b *1/344*

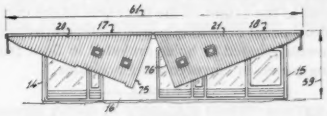
U.S. Cl. 52—64 **45 Claims**

1. The combination of a prefabricated parallelepiped box-shaped section for inclusion in a building comprised of a plurality of such sections and portions of a roof for said sections, the combination comprising:

said section;

at least two said roof portions;

hinge means disposed at a first end of said section, said hinge means pivotally connecting a first of said roof portions to the top of said section whereby said first portion is selectively pivotable about an angle having its apex proximate the upper edge of said first end from a substantially horizontal transport position adjacent the top of the section to the desired roof angle in the completed building;



connection means disposed at the second end of said section opposite said first and comprising a slideable part for receiving the second of said roof portions when in a substantially horizontal transport position adjacent the top of the section and for sliding therein when the roof is raised to its position in the completed building and securing means for securing said second roof portion in its position in the completed building, said connection means being mounted on the section proximate the upper edge of its said second end.

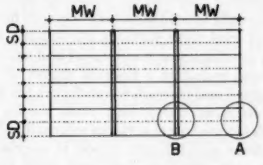
3,890,748
STRUCTURE OF COORDINATED MODULAR BUILDING CONSTRUCTION

Miroslav Fencl, 59-28 57th Dr., Flushing, N.Y. 11378

Continuation-in-part of Ser. No. 369,562, June 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 294,391, Oct. 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,935, Sept. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 143,547, May 14, 1971, abandoned. This application July 15, 1974, Ser. No. 485,461

Int. Cl.² E04H *1/04*

U.S. Cl. 52—79 **6 Claims**



1. A modular structure assembled of a plurality of self-supporting modules made of reinforced concrete, each module having a form of a rectangular tube defined by two walls, a floor slab and a ceiling slab, said structure being composed in a "wall beside wall - front end to back end - floor slab over ceiling slab" fashion so that adjacent walls create a doubled wall structure and adjacent floor-and ceiling slabs create a doubled floor structure;

each said module being imaginarily divided into several equal tubular segments of which the depth is denoted as a segmental depth - SD - ;

said modules being composed of structurally interconnected components - walls manufactured as one-piece panels, floor- and ceiling slabs consisting of one or several panels manufactured in widths which are multiples of SD; said components being manufactured substantially as a ribbed slab with one surface flat and opposite surface fluted at least one flute of ceiling slab aligned with a corresponding flute of walls;

solid rims being provided at both wall ends in said floor- and ceiling panels;
solid rims being provided at bottom of said wall panels;
at least two vertical pipes - each provided with a lifting nut welded at top - being embedded in each said wall panel and positioned at uniform distance T from outer side of wall panel and at uniform distance D from wall end or SD line, respectively;
vertical reinforcing bars being embedded in each wall panel and positioned generally on rib- and wall thickness centers;
both said pipes and bars protruding at wall top and wall bottom to the extent of the thickness of the corresponding floor panel or ceiling panel, such protrusions serving as dowels grouted in holes provided in floor panels and ceiling panels in corresponding positions.

3,890,749

REINFORCEMENT ASSEMBLY FOR INTERNALLY BRACED STRUCTURES HAVING AREAL OUTER SURFACES

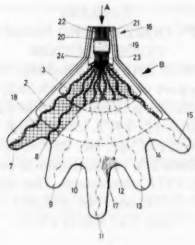
Rolf Günther, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed July 15, 1974, Ser. No. 488,439

Claims priority, application Germany, July 18, 1973, 2336541

Int. Cl. E04c *2/36;* **B64c** *3/18, 1/24*

U.S. Cl. 52—84 **17 Claims**



1. A reinforcement assembly for mounting and transmitting forces to an internally braced structural element having means defining thereon areal outer surfaces, particularly a structural element for use in vehicles such as aircraft and spacecraft, said structural element including a fulcrum region at which said element is mounted and through which forces are transmitted thereto, said assembly comprising plate means extending generally parallel to said areal surfaces internally of said structural element from said fulcrum region in overlapping relationship on opposite sides thereof, said plate means being arranged to provide to said structural element fiber reinforcement which increases in the direction of said fulcrum region, and web means extending between said opposed plate means in directions generally perpendicular thereto, said web means being arranged to also extend radially outwardly from said fulcrum region in a generally diverging configuration.

3,890,750

CONSTRUCTION SYSTEM

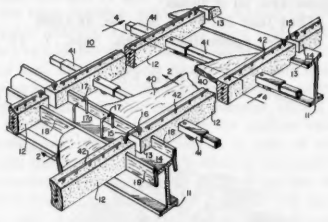
Herbert M. Berman, and Ira Hooper, both of New York, N.Y., assignors to Composite Construction Systems, Inc., New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,549

Int. Cl. E04b *1/16*

U.S. Cl. 52—127 **1 Claim**

1. A construction system comprising at least three horizontally disposed, spaced, structural members, each of said structural members being in an elevated position and secured to base supports, a plurality of horizontal trusses laterally bracing a portion of said structural members, a plurality of spaced, parallel concrete joists securely engaging and transversely extending between each pair of adjacent structural members, and means to connect adjacent end portions of said concrete joists to each other or to said structural members to form



continuous tension or compression ties at selected intervals along top flanges of said structural members, said continuous ties terminating in said horizontal trusses, and a plurality of reusable, longitudinally extensible and retractable support members supported by said joists and adapted to support concrete slab forms to receive concrete thereover.

3,890,751

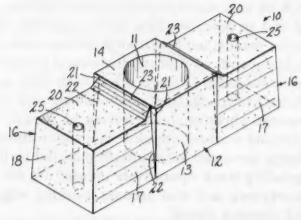
POST HOLE BLOCK

Arnold P. Caputo, Hamden, Conn.; David W. Anthony, Norwell, and William H. Pickett, Framingham, both of Mass., assignors to Plasticrete Corporation, Hamden, Conn.

Filed Mar. 11, 1974, Ser. No. 449,981

Int. Cl. E02d *27/42*

U.S. Cl. 52—166 **4 Claims**



1. A post hole block comprising a body of heavy material, substantially rectangular in horizontal cross-section and horizontally elongated, said body being provided midway between its longer sides with a vertical hole to receive a post, and the upper surface of the body spaced from said hole being lower than the upper surface adjacent said hole, the block having a central section and lower end sections, said hole being in the center of the central section, and at least a portion of the upper surface of each end section sloping upward to the level of said central section, said block being traversed by additional smaller holes each extending from points on the upper surface spaced from said vertical hole downward through the body.

3,890,752

SECURING GLAZING RAILS TOGETHER

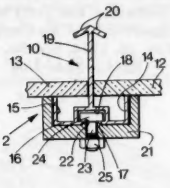
Frank Edmund Bolton, Royal Leamington Spa, England, assignor to Banbury Buildings Holdings Limited, Warwickshire, England

Filed Nov. 20, 1973, Ser. No. 417,561

Claims priority, application United Kingdom, June 23, 1973, 29950/73

Int. Cl. E04c 3/06

U.S. Cl. 52—495 1 Claim



1. A greenhouse or like structure including a glazing assembly comprising at least a pair of glazing rails connected together end-to-end and a pane of glazing material supported by said rails along an edge of said pane, a rib on each said rail extending longitudinally thereof and having a cross-section of channel shape inverted with respect to the plane of the pane and having in its wall remote from the pane, a longitudinal slot giving access to an undercut longitudinal recess defined in the rib, and a connector having a cross-section of channel shape to fit closely over the ribs of the rails to bridge abutting end portions thereof, the inner face of the base of the connector being formed with an inwardly-projecting tongue fitted into the slots in the outer faces of the ribs of the rails, whereby the latter are held from lateral and twisting movement relatively to one another by engagement of the sides of the connector with respective sides of the ribs of the rails and by engagement of the tongue on the connector in the slots in the ribs of the rails, the connector including a fastener by which said connector is secured to each said rail, said fastener having an inner end retained in the undercut recesses in the rails.

3,890,753

CEILING OR WALL COVERING

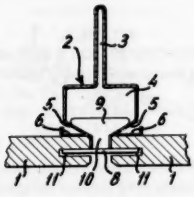
Jørgen Skoubo Johansen, No. 26 Hjortespringparken, 2730 Herlev, Denmark

Filed Mar. 13, 1973, Ser. No. 340,724

Claims priority, application Denmark, Mar. 22, 1972, 1332/72

Int. Cl. E04b 5/57

U.S. Cl. 52—500 4 Claims



1. A ceiling or wall covering comprising:

parallel supporting rails, an undercut groove in each rail,

a plurality of panels,

locking members, each of which has a body with at least one retaining wing for engaging adjoining edges of two adjacent panels, a head, and a neck portion,

said panels being detachably fastened to said rails by said locking members, each of said bodies being turnable and slidable in the groove of an associated supporting rail, each of said bodies being fixed in its associated rail by turning said body about an axis at right angle to the face of the panel,

adjacent panels being separated by a space located directly adjacent and parallel to an associated supporting rail, each space providing access for a tool such as a screwdriver to turn and slide each of said locking members in the groove of its associated supporting rail, and

the greatest cross-sectional dimension of the neck portion of each locking member is less than the width of said space.

3,890,754

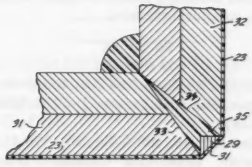
CORNER BEND IN FIBROUS SHEET MATERIAL

Graham David Spurdle, 675 Alpine Ct., North Vancouver, British Columbia, Canada

Filed Oct. 9, 1973, Ser. No. 404,228

Int. Cl. F04c 2/00

U.S. Cl. 52—631 3 Claims



1. An exterior corner structure for a rigid sheet of fibrous material having a flexible sheet of finishing veneer on the exterior surface thereof comprising:

a. a pair of sheet portions connected by said veneer extending unbroken between the two sheet portions,

b. said sheet portions being at substantially a right angle to each other,

c. said sheet portions having bevelled end faces,

d. a central rib of triangular cross-section disposed between said end faces and connected to said veneer and having side surfaces spaced from said bevelled end faces,

e. the inner edges of said sheet portions being in contact with each other and said end faces being non-parallel to each other whereby a space is defined by said end faces of said sheet portions and said side surfaces of said central rib, and

f. an adhesive substantially filling said space and bonded to said end faces and said side surfaces.

3,890,755

CONSTRUCTION SET

Dieter Specht, Dhunn, Germany, assignor to Masyc AG, Laufen, Switzerland

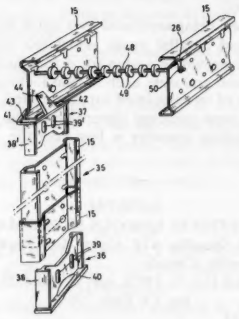
Filed May 23, 1973, Ser. No. 363,045

Int. Cl. F04c 3/08

U.S. Cl. 52—645 6 Claims

1. In a construction set, a structural element comprising an elongated web having a first and a second transversely spaced longitudinally extending margins, a first flange extending along said first margin, a second flange extending along said second margin, and a plurality of cutouts spaced along said elements and including a first row of equidistant cutouts arranged parallel to said first margin adjacent said first flange, and a second row of equidistant cutouts arranged parallel to said second margin adjacent said second flange, the cutouts of said first row being aligned in the transverse direction of said web with the corresponding cutouts of said second row; and a disc-shaped connector having an axis of rotational symmetry

and provided with two elongated arcuate holes extending along a circular arc having a center located within said axis of rotational symmetry and a diameter corresponding to the



distance between said first and second rows of cutouts, said connector further including means for accommodation in said cutouts of said structural element.

3,890,756

CONCRETE REINFORCEMENT

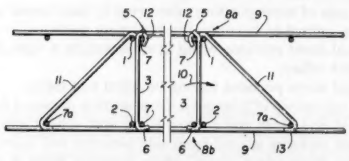
Edmund Wagner, Rheinblickstr. 6, D-6202 Wiesbaden-Bierbrich, Germany

Filed July 16, 1973, Ser. No. 379,411

Claims priority, application Germany, July 15, 1972, 2234941

Int. Cl. E04b *5/04;* **E04c** *3/02*

U.S. Cl. 52—648 **3 Claims**



1. A reinforcement for an at least partially prefabricated reinforced concrete slab, comprising in combination:

1. two structural steel mats each comprising a plurality of longitudinally extending steel rods and a plurality of transversely extending steel rods substantially perpendicular to the longitudinal rods;

2. a plurality of planar lattice girders extending between the two mats and comprising only a single upper boom rod, a single lower boom rod and affixed thereto a plurality of braces extending diagonally between the upper and lower boom rods, the girder extending in the direction of the longitudinally extending steel rods of the mats;

a. the said braces having bent terminating ends facing opposite the side to which the upper and lower boom rods are affixed, one terminating end partially encir-cling and thereby supporting a longitudinal rod of the structural steel mats, the opposite terminating end being hook-shaped,

b. the lower boom rod being carried by the transverse rods of one of the structural steel mats, and

c. the upper boom rod being in contact with the transverse rods of the steel mat spaced from the mat carrying the lower boom rod, and

d. said plurality of planar lattice girders being spaced apart along the said structural steel mats; and

3. a plurality of tension rods each extending transversely to the plane defined by the booms affixed to one of the longitudinal rods of the one structural steel mat, the tension rod partially encircling and thereby supporting one of the boom rods, and

4. a pair of girders and tension rods being associated in mirror-image fashion.

3,890,757

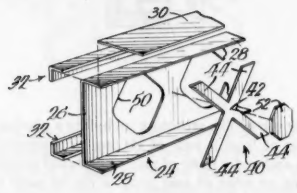
BOOM MEMBERS HAVING STIFFENER ELEMENTS FOR CRANE BOOM CONSTRUCTIONS

Gerald P. Lamer, Rothschild, and Terry M. Holmes, Schofield, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Feb. 28, 1974, Ser. No. 446,593

Int. Cl. E04c *3/08*

U.S. Cl. 52—695 **7 Claims**



1. A boom for a crane or the like comprising an elongated hollow member having a plurality of flat walls, at least one of said walls having a plurality of openings spaced from each other, a stiffening element located between each adjacent pair of openings, each stiffening element having a central core generally aligned with a longitudinal center line for said at least one wall and a plurality of arms extending from said central core to the outer edges of said at least one member, said stiffening elements being secured to a surface of said at least one wall between said openings and reinforcing the edges of said openings, and a plurality of buttons each having a dimension greater than the dimension of said cores, said buttons overlying respective central cores and being secured to said surface.

3,890,758

ANCHORING DEVICE FOR SECURING AND POSITIONING EQUIPMENT

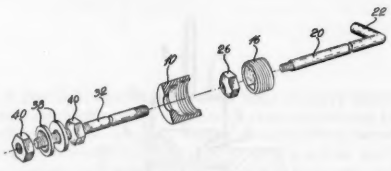
Michel Bouchard, 4200 Dorchester St., Montreal H3Z 1V3, Quebec, Canada

Filed Nov. 29, 1973, Ser. No. 420,298

Claims priority, application Canada, Feb. 28, 1973, 164858

Int. Cl. E04b *1/41;* **E02d** *27/44*

U.S. Cl. 52—713 **10 Claims**



1. An anchori· device for securing equipment to a concrete structure poured in at least two phases and for precisely positioning said equipment in said structure, comprising:

a. a threaded rod securable to the equipment,

b. a nut on said rod having a spherical face,

c. a socket having a hole therein receiving said rod, said hole being larger than said rod, said socket also having a

matching spherical internal recess for receiving said nut therein,

d. a plug connected to said socket with said nut therebetween whereby said nut is prevented from rotation by the plug, and

e. an anchor connected to said plug and adapted to be positioned within the primary phase of the concrete structure.

3,890,759

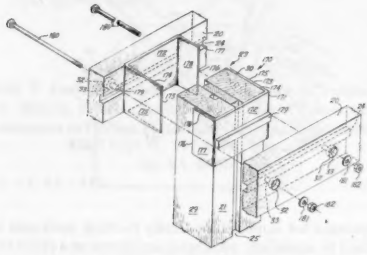
CONNECTOR

Robert W. Selden, and Edward W. Schein, both of Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Division of Ser. No. 137,382, April 26, 1971, Pat. No. 3,777,434. This application Oct. 11, 1973, Ser. No. 405,724

Int. Cl. E04c *3/12*

U.S. Cl. 52—753 C **2 Claims**



1. An assembly comprising

a pair of members,

each member having a center plate and a pair of legs extending outwardly from one face of said plate,

said legs being transverse of a longitudinal direction of said plate and being substantially parallel,

one of said legs being tapered on its inner face and the other of said legs being tapered on its outer face,

a key extending longitudinally of the outer face of said center plate,

the legs of said members extending toward each other and said members being joined along said tapered faces,

said members being wedged against an element extending centrally through said members, and

a pair of other elements being held against the outer faces of said center plates,

said latter elements having grooves on their inner faces which mate with said key, and

means holding said latter elements against said center plate, and said connector to said former element.

3,890,760

MAIN BEAM JOINT FOR SUSPENDED CEILINGS

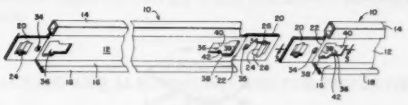
Paul H. Jones, Willow Grove, Pa., assignor to National Rolling Mills Co., Malvern, Pa.

Filed Jan. 25, 1974, Ser. No. 432,680

Int. Cl. F16b *7/22*

U.S. Cl. 52—758 A **11 Claims**

1. A main beam for use in a suspended ceiling grid structure comprising an elongated central web, means providing oppositely disposed bottom flanges at the lower edge of said central web, and coupling means integral with the main beam for connecting the end of the main beam to the end of another similarly constructed main beams, said coupling means including an extension on the end of said central web and offset laterally relative thereto, a tongue member projecting laterally from said extension with a pair of spaced guide edges and a pair of engaging lugs extending from the guide edges, a longitudinally extending slot formed in said central web adjacent said extension having an enlarged entrance portion connected to a smaller sliding portion with the enlarged entrance portion receiving the tongue member and its lugs, said smaller sliding portion having a pair of spaced longitudinally extending slot



edges which are spaced apart approximately the same amount as the guide edges of the tongue member and which receive said tongue guide edges in a manner such that the tongue guide edges ride between said slot edges and the tongue member lugs reach through the slot and engage the distal side of the slot and the slot gives sliding support to the tongue member.

3,890,761

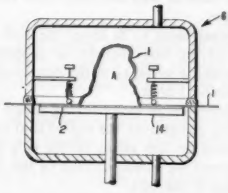
VACUUM SKIN PACKAGING METHOD

Harold Eugene Ramsey, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 17, 1973, Ser. No. 407,249

Int. Cl. B65b *31/02*

U.S. Cl. 53—22 A **1 Claim**



1. A method of forming a vacuum skin package is provided including the steps of:

positioning an article to be packaged between a top and bottom web of plastic film, with the bottom part of the article resting on the bottom web;

pushing, by means of web positioning means, the top web into a first package forming position whereat such top web is in contact with the top part of the article, is closely adjacent all the side parts of the article, and is spaced from and is closely adjacent but not sealed to the bottom web;

removing air from between the top and bottom webs while the top web is in the first package forming position;

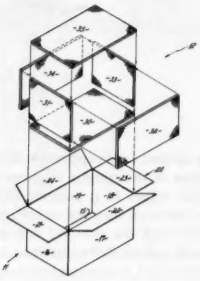
moving, by means of web positioning means, the top and bottom webs relative to each other and into a second package forming position whereat spaced parts of the top web are in sealing contact with opposed parts of the bottom web, still leaving other spaced, opposed parts of the top and bottom web unsealed; and

pushing, by means of air exerted on the outer surface of the top web, the top web into a third package forming position, whereat such other spaced, opposed parts of the top and bottom webs are in sealing contact and other parts of the top web are in skin-like contact with the top and side parts of the article thereby to form a sealed vacuum skin-package.

3,890,762
PRODUCE SHIPPING CONTAINER AND PACKING METHOD

G. Fred Ernst, and William P. Faulkner, both of Lexington, Ky., assignors to Day Star Corporation, Lexington, Ky.

Filed Aug. 20, 1973, Ser. No. 389,723
Int. Cl. B65b 55/14; B65d 5/40, 5/62
U.S. Cl. 53—25 10 Claims



1. A method of packing produce for shipment comprising, preparing a slab of polystyrene foam having a density of 0.5–1.5 lbs./cu. ft.,

cutting flat sheets of polystyrene from said slab,

cutting said sheets into panels fittable in facial proximity against the respective inside surfaces of a box, said box made of air permeable sheet material having a bottom wall, side walls, and a top,

placing so cut bottom and side panels within said box against the bottom wall and side walls thereof to form a liner therefor,

said panels being sized to fit snugly against one another at the edges of the box thereby to support one another against the inside surfaces of the box to define a packing space within said liner,

packing produce within said packing space,

placing a cover panel over the top of said space, the cover panel residing on top edges of the side panels so as to reside adjacent the inside surface of the top of the box,

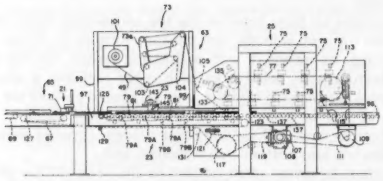
closing the top of the box,

and cooling the closed, packed container to shipment temperature.

3,890,763
PACKAGING MACHINE AND METHOD

John E. Ullman, Huntingdon Valley, Pa., assignor to Huntington Industries Incorporated, Bethayres, Pa.

Filed Oct. 9, 1973, Ser. No. 404,642
Int. Cl. B65b 53/02, 7/00
U.S. Cl. 53—39 27 Claims

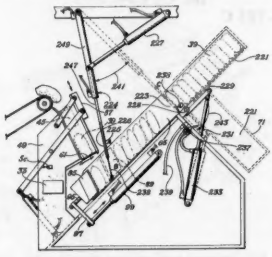


1. A method of packaging articles such as cans, bottles and the like in a series of trays having a bottom and upstanding walls extending therefrom with a first pair of spaced-apart walls connected together by a second pair, conveying a series of filled trays along a predetermined path, comprising the steps of applying an adhesive onto said first pair of walls, placing a film sheet over a plurality of said trays, disposing said film sheet against said applied adhesive on said walls and over said articles, compressing said film sheet against said applied adhesive on said walls until the adhesive sets, separating the film sheet between trays, and shrinking said sheet to hold the articles to the tray.

3,890,764
SEMI-AUTOMATIC PACKING OF PACKAGES

Carl C. Hartman, 415 N. Pacific, Mineola, Tex. 75773

Division of Ser. No. 267,022, June 28, 1972, Pat. No. 3,815,321. This application Mar. 25, 1974, Ser. No. 454,449
Int. Cl. B65b 57/10, 57/20
U.S. Cl. 53—61 13 Claims



1. Apparatus for semi-automatically packing packages being supplied by automatic packaging apparatus at a rapid rate, comprising:

a. at least one chute; said chute being upstanding such that gravity will effect movement of said packages longitudinally thereof;

b. gate means for accumulating a series of at least one package from said at least one chute; said gate means having a gate moving means for moving said gate from beneath said series caught thereon, referred to as being moved to an open position, and for moving said gate into position beneath the bottom end of said at least one chute to receive a next series from said at least one chute, referred to as being moved to a closed position;

c. switch means for effecting moving of said gate means into its respective open and closed positions; said switch means being connected with said gate moving means and monitoring a respective said at least one chute such that said gate moving means moves said gate means into its open position after passage of a package down said chute;

d. receiver means for receiving said packages from said gate means; said receiver means being positioned beneath said gate means and such that said packages are retained at a desired position in which they are emplaced into said receiver means; said receiver means comprising a load chute that is inclined at an angle sufficient to hold said packages in said desired position as they are moved up said load chute;

e. clearance means for effecting a clearance space in said receiver means sufficient to receive the next said series from said gate means until a predetermined number of packages are emplaced in said receiver means; said clearance means comprising a ram for advancing said plurality of packages longitudinally of said load chute and a comb for holding said packages at the position to which they are advanced by said ram when said ram is retracted away from said packages;

f. package moving means for effecting movement of said series of said at least one package from said gate means into said receiver means in a desired position; said package moving means comprising gravity in combination with said gate moving means for moving said gate into its

open position to allow the accumulated said series to fall into said active load chute in front of said ram and for moving said gate means into its closed position to accumulate a next said series; and

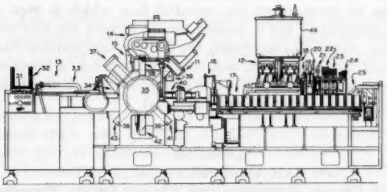
g. a package pack moving means for moving said predetermined number of packages included in a pack to make room for the next series of at least one package from said at least one chute; said package pack moving means comprising a pivotally mounted surge chute linearly aligned with said load chute and disposed adjacent the open end of said load chute so as to receive packages moved longitudinally out of the open end of said load chute; and second means comprising a second comb that has a free end that is movable into a pre-load position behind said predetermined number of packages and movable longitudinally of said load chute to a load position to move said packages out of the open end of said load chute and into said pivotally mounted surge chute; and second moving means for moving said free end of said second comb; said second moving means being connected with said second comb.

3,890,765

CARTON FORMING MACHINE

Silvio T. Farfaglia; Leslie O. Coburn, both of Fulton; Robert G. Halpin, Minneto, and Ronald E. Bock, Fulton, all of N.Y., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,037
Int. Cl. B65b *3/02*
U.S. Cl. 53—183 **45 Claims**



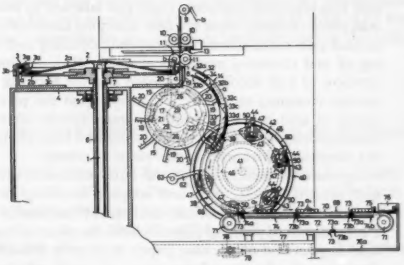
1. A machine for forming a tubular carton from a generally rectangular flat sidewall blank having thermoplastic coatings on the upper and lower surfaces thereof and having first and second side margins and top and bottom margins, which comprises a forming mandrel, means for wrapping said sidewall blank around said forming mandrel to overlap said first and second side margins thereof, a conveying means having a conveyor run on which said blank is to be transported through a heating station to said forming mandrel, said conveying means having means for engaging a blank deposited on said conveyor run, a supply magazine means for containing a plurality of said blanks, transfer means for successively withdrawing individual blanks from said supply magazine means and for depositing each thus withdrawn individual blank on said conveyor run, holding means for maintaining the position to the thus deposited blank on said conveyor run until after the thus deposited blank is contacted by said means for engaging, means for actuating said holding means to contact said thus withdrawn individual blank as the blank is being deposited on said conveyor run, means for periodically activating said conveying means, means for actuating said transfer means during the time said conveying means is inactive, a first conduit means positioned in said heating station at least generally parallel to and spaced generally upwardly from the location which would be occupied by the upper surface of the first side margin of the blank in said heating station, said first conduit means having orifices therein spaced along the length thereof and directed at the location which would be occupied by said upper surface of said first side margin of the blank in said heating station, a second conduit means positioned in said heating station at least generally parallel to and spaced generally downwardly from the location which would be occupied by the lower surface of the second side margin of the blank in said heating station, said second conduit means having orifices therein spaced along the length thereof and directed at the location which would be occupied by the lower surface of said second side margin of the blank in said heating station, and means for supplying a hot gas to said first and second conduit means.

3,890,766

PACKING AND ALIGNING DEVICES FOR PIECES OF CANDY

Akihiro Hatta, Sakai, Japan, assignor to Tenchi Kikai Kabushiki Kaisha, Sakai, Japan

Filed Mar. 25, 1974, Ser. No. 454,609
Claims priority, application Japan, Apr. 7, 1973, 48-39877
Int. Cl. B65b *11/30*
U.S. Cl. 53—234 **8 Claims**



1. A packing and aligning device for candy of square columnar hexahedron, said device comprising, in combination:

a rotary disk for receiving a large number of collectively thrown pieces of candy on the surface of the disk rotating horizontally;

a guide channel disposed on the circumference of said disk and designed to receive and transfer the pieces of candy on the disk in longitudinal alignment;

a feed channel for receiving pieces of candy from said guide channel into which they were received, said feed channel being formed in the side of the terminal thereof with an opening for taking out candy and with a receiving portion fronting said opening and adapted to receive packing paper cut into a specified size thereinto, and being further formed below said terminal portion and in the side opposite to said opening with a crossing path permitting the passage of a member clamping said candy therethrough; packing paper feed means for cutting packing paper into a specified size and feeding the same to said packing paper receiving portion, said means including a mechanism for unrolling a long roll of packing paper and cutting said packing paper into specified lengths;

a takeout turret for clamping the pieces of candy in the terminal portion of said feed channel one by one together with the packing paper and transferring the candy thus clamped together with the paper along a first transfer path, said turret including a first turret base rotating at constant speed in the direction in which it crosses said feed channel, plural pairs of first clamping members pivotally supported at equal spaces on the circumference of said base and adapted to clamp said candy together with packing paper by the clamp portions thereof, and a set of first cam mechanism for controlling each of said clamping members so that the members make closing and opening operation in the direction of rotation of said base by rotation of the base, carry out said clamping in the terminal portion of said feed channel, and release said clamping at the terminal of said first transfer path;

first folding members positioned along the inner and outer circumferences and on both sides of said first transfer path and adapted for successively bending surplus ends of packing paper over the four sides adjacent to the front side of the piece of candy facing the inner and outer circumferences and both sides of said first transfer path, said surplus ends of packing paper being the surplus ends of the packing paper brought into clamped contact with the front side of said piece of candy;

a relay transfer turret for clamping at the terminal of the first transfer path the piece of candy clamped by said takeout turret, transferring the same along a second transfer path, and releasing said clamping at the terminal of the path, said turret including a second turret base rotating in synchronism with the first turret base, plural pairs of second clamping members pivotally supported at equal spaces on the circumference of said base and adapted to clamp the piece of candy in the terminal portion of the first transfer path, said piece of candy being clamped by said first clamping members, in the direction intersecting at right angles with the direction in which said first clamping members open and adapted to receive said piece of candy from the first clamping members, and second cam mechanisms for operating opening and closing of said clamping members at a specified position by rotation of said second turret base and for rotating said second clamping members, which clamped the piece of candy at said specified position, immediately after the members clamped the piece of candy and then changing the direction of transfer of the piece of candy;

a swing member positioned on the outer circumference of said second transfer path and adapted to swing in synchronism with rotation of said each turret base and to fold a surplus end of packing paper behind the piece of candy, said surplus end of packing paper projecting behind the direction of advance of the piece of candy which was changed in the direction of transfer by said cam mechanisms;

second folding members positioned on the outer circumference side of said second transfer path and adapted to fold over the folded surplus end of said front side a surplus end of packing paper on the front side of the piece of candy being transferred and then to fold the folded surplus ends jutting out on both folded sides internally and longitudinally of the piece of candy; and

an aligning and transfer mechanism designed to receive in a laterally aligned state the packed pieces of candy released at the terminal of said second transfer path from clamping by the relay transfer turret and to group, push and feed said packed pieces of candy by each specified quantity.

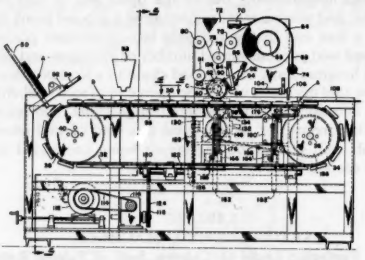
3,890,767

APPARATUS FOR APPLYING LIDS TO CONTAINERS

Richard S. Cawrse, 915 Beachside Ln., Huron, Ohio 44839

Filed Nov. 23, 1973, Ser. No. 418,608
Int. Cl. B65b *7/28*
U.S. Cl. 53—296 **6 Claims**

1. Apparatus for applying lids to the upper open ends of containers comprising conveyor means having indexing means to convey successive containers thereon horizontally in stepwise manner to a lidding position; a mandrel of polygonal cross-section at such lidding position disposed above said conveyor means; drive means for said mandrel operative to rotatably index said mandrel about a horizontal axis to horizontally position successive faces thereof above a container at such lidding position; means creating a vacuum on the mandrel face which is at lidding position and on at least the next two mandrel faces; means supporting a roll of lid material having heat sensitive adhesive material on one side thereof for rotation of said roll about an axis parallel to that of said mandrel for application of the leading end portion of said lid material onto at least the last one of the mandrel faces which have vacuum applied thereon with the other side of said lid material held by vacuum against said face whereby indexing of said mandrel will unwind said lid material from said roll to advance it to lidding position as the mandrel is successively indexed; knife means operative in response to indexing of said mandrel to cut the lid material at a vertex between such next faces; heating means in said mandrel effective to heat the lid material to activate said heat sensitive material on one side for adherence to the container at lidding position; elevator means operative to raise and lower a container at said lidding position to press the upper open end thereof against the heat activated side of the lid on the mandrel face which is then at lidding position, and to lower the container with the lid adhered thereto with respect to said mandrel; and valve means operative in response to elevation of said elevator means for applying air pressure on the mandrel face which is then at lidding position to aid in sealing the lid against the elevated container, to assist in separating the lid from said mandrel face when said elevator means and container thereon is lowered, and to provide a cooling effect on said lid to assist in deactivating said heat sensitive adhesive material.

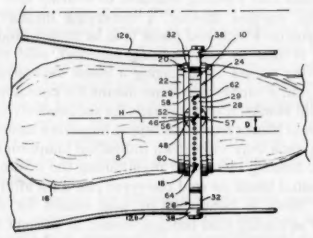


3,890,768

TOW BAR ASSEMBLY FOR SULKY

Clarence Gaines, Sherburne, and Chester Depew, Farmingdale, both of N.Y., assignors to Clarence Gaines, Sherburne, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,754
Int. Cl. B68c *1/00*
U.S. Cl. 54—39 **7 Claims**



1. A tow bar assembly for coupling a sulky having a pair of laterally spaced shafts to opposite sides of a horse comprising:

a belt like saddle means engageable around said horse and overlaying the back of said horse;

a flexible pad underlying said saddle means on the back of said horse;

an inverted U-shaped bar structure having a bight and depending sides; and

an attachment means for pivotally and adjustably securing the bight of said bar structure at a selected point to said

saddle means with said bight extending transversely of said horse so that said shafts may be secured to said depending sides of said bar structure said attachment means comprising:

a stationary threaded stud secured to said pad and extending through said saddle means at the central plane of symmetry of said horse; and

a nut engaged on said stud.

3,890,769

HAY MAKING MACHINES

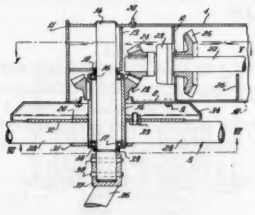
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Division of Ser. No. 231,899, March 6, 1972, Pat. No. 3,785,133. This application Nov. 19, 1973, Ser. No. 417,230

Claims priority, application Netherlands, Mar. 5, 1971, 7102932

Int. Cl. A01d *79/00*

U.S. Cl. 56—1 **10 Claims**



1. A method of operatively connecting rotary rake members on agricultural implement in driving engagement with the power take off of a prime mover, comprising passing the shaft of an input pinioned shaft through an opening in the front wall of an elongated hollow frame beam having an open bottom, entering a drive shaft having pinion gears mounted at each end thereof each with bearings together with an intermediate pinion gear, all assembled as a unit, through the open bottom of said frame beam, retaining the further pinion gear in driving engagement with the input shaft and securing the bearings within recesses of partitions that are spaced apart within said frame beam, and fastened to same adjacent each end thereof, positioning the drive shaft parallel to the longitudinal axis of the beam, then connecting the end pinion gears of said drive shaft to the driving gears of each of the rotary members.

3,890,770

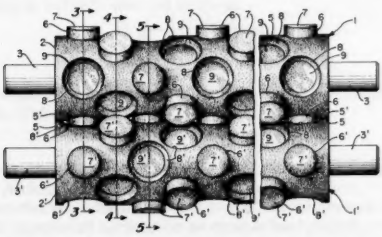
HAY CONDITIONER ROLL

Paul E. Milliken, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 28, 1974, Ser. No. 446,975

Int. Cl. A01d *73/00*

U.S. Cl. 56—1 **12 Claims**



1. A roll assembly for use on a hay conditioning machine comprising a pair of intermeshing rolls disposed in adjacent parallel relationship, each of said rolls comprising:

A. an elongated cylindrical elastomeric body portion having a peripheral surface which contacts a similar peripheral surface on the other roll as the rolls rotate;

B. a plurality of spaced apart lugs extending radially outwardly from the peripheral surface of each roll and having a top surface;

C. a plurality of spaced apart depressions extending radially inwardly from the peripheral surface of each roll and having a bottom surface;

D. the relative position of the lugs on each roll being such that they correspond to the depressions in the opposite roll;

E. the top surface of each lug contacting the bottom surface on the corresponding depression on the opposite roll as the rolls rotate;

F. the relative positions of the lugs and depressions on the rolls being such that as the rolls rotate hay passing between them is crushed between both the contacting peripheral surfaces of the rolls and between the tops of the lugs and the bottoms of the corresponding depressions and the hay is crimped around the corners formed by the lugs, depressions and the peripheral surfaces of the rolls.

3,890,771

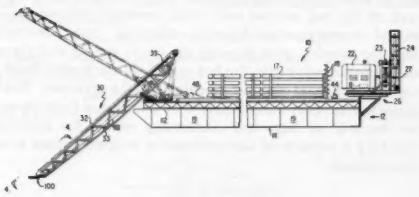
AQUATIC HARVESTER WITH IMPROVED FLOTATION SYSTEM

Thomas G. Kelpin, 8877 Boyonne Dr., Shreveport, La. 71108

Filed Jan. 19, 1973, Ser. No. 325,066The portion of the term of this patent subsequent to Oct. 17, 1989, has been disclaimed.

Int. Cl. A01d *45/08*

U.S. Cl. 56—9 **11 Claims**



1. An aquatic harvester comprising

an aquatic craft having a plurality of pontoon members secured longitudinally beneath a deck member said deck member being adapted to receive a payload of harvested aquatic material,

a pick-up assembly mounted on said craft for aquatic material both at and below the surface of the water and

as the sole means of propulsion an steering, a single above-the-water propulsion and steering system having an air propulsion unit, mounting means for said air propulsion unit capable of rotating 360° about a vertical axis, wherein said unit comprises an engine, an aerodynamic propeller and means connecting the crankshaft of said engine to the propeller,

each of said pontoon members comprising at least one closed, integrally formed buoyant capsule constructed of a synthetic resinous material.

3,890,772

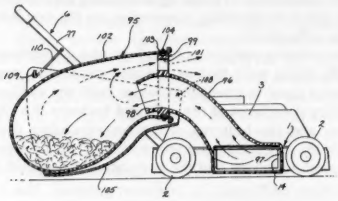
SELF-PROPELLED LAWN MOWER

Lester H. Seifert, R.R. No. 2, Park Ave., Kiel, Wis. 53042; Raymond P. Powers, 3515 N. 10th St., Sheboygan, Wis. 53081; William M. Schmidt, 35 Claireview Rd., Grosse Point Farms; Stanley E. Thorwaldsen, 286 Williams St., Grosse Point, both of Mich. 48236; Frederick Smith, 247 Cambridge, Mt. Clemens, Mich. 48043; David C. McElroy, 22000 St. Gertrude, St. Clair Shores, Mich. 48081, and Roy P. Dunton, 37446 Charter Oaks, Mt. Clements, Mich. 48043

Division of Ser. No. 289,539, Sept. 15, 1972, Pat. No. 3,802,170. This application Feb. 1, 1974, Ser. No. 438,589

Int. Cl. A01d *35/22*

U.S. Cl. 56—202 5 Claims



1. A grass catching attachment for connection to a rotary lawn mower, said lawn mower including a housing having a discharge outlet, power means mounted on the housing, and rotary cutting means disposed within the housing and operably connected to said power means, said mower also including handle means attached to the housing, said attachment comprising chute means removably connected with the housing and having one end communicating with said discharge outlet, the opposite end of said chute means defining an outlet opening, means connected to said opposite end of the chute means and defining a second opening located adjacent said outlet opening, an impervious throw-away bag having a neck bordering an open end thereof, means for removably securing the neck of the bag around said outlet opening and around said second opening, whereby grass clippings being discharged from the housing pass through the chute means and through said outlet opening into the bag and air is discharged from the bag through said second opening to the exterior, flexible protective support means carried by the mower for supporting the throw-away bag, and connecting means for removably attaching a portion of said protective support means to said chute means.

3,890,773

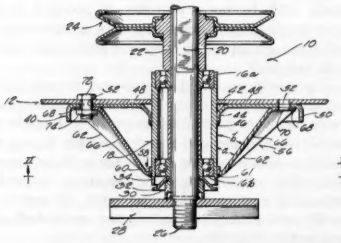
MOWER BLADE SUPPORT ASSEMBLY

Charles C. Frost, Newaygo, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Dec. 12, 1973, Ser. No. 426,613

Int. Cl. A01d *55/18*

U.S. Cl. 56—255 11 Claims



7. In a rotary mower drive assembly including an elongate spindle housing, spaced bearing means secured in said housing, a spindle journaled for rotation in said bearings, and mounting means extending from said housing for mounting said housing and said spindle to a lawn mower deck; the improvement comprising:

a support fixed to said housing, said support being spaced from said mounting means along the length of said spindle housing; wall means on said support member extending angularly outwardly from said housing and into abutment with said mounting means for securement therewith to said lawn mower deck, one of said support and mounting member being secured to said housing intermediate said spaced bearing means.

3,890,774

GRAPE-GATHERING MACHINE

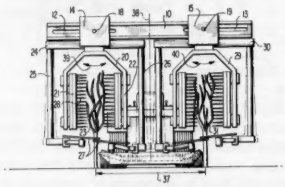
Alain Bruel, Domaine du Petit Chaumont, Aigues Mortes, France

Filed June 7, 1973, Ser. No. 367,903

Claims priority, application France, June 7, 1972, 72.21140

Int. Cl. A01g *19/00*

U.S. Cl. 56—330 5 Claims



1. A grape gathering machine comprising a wheeled chassis, draw bar means for connecting said chassis to a tractor, a front gantry and a rear gantry mounted on said chassis transversely of the longitudinal axis of the chassis, a pair of parallel spaced apart travellers adjustably mounted between said front and rear gantries, adjusting means for varying the spacing between said travellers and a first and second plurality of inverted U-shaped frame means pivotally suspended from said travellers to define two tunnels adapted to surround two rows of vines simultaneously, said first frame means having beater means thereon and said second frame means having recovery means thereon.

3,890,775

BEATING DEVICE FOR A GRAPE-GATHERING MACHINE

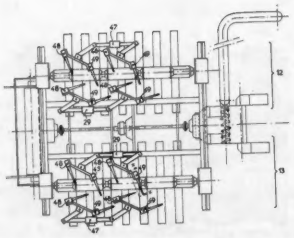
Alain Bruel, Domaine du Petit Chaumont, Aigues-Mortes, France

Filed June 11, 1973, Ser. No. 368,787

Claims priority, application France, June 9, 1972, 72.21513

Int. Cl. A01g *19/00*

U.S. Cl. 56—330 15 Claims



1. In a beating device for a grape gathering machine of the type having a mobile structure, and at least one tunnel defin-

ing member in the shape of a downwardly open "U" having two vertical arms attached to the mobile structure such that the two vertical arms move along either side of a row of vine stocks, the improvements comprising:

a. at least a pair of spindles pivotally attached to each of said vertical arms and extending parallel thereto;

b. a frame pivotally attached to each spindle, equidistantly from either end of the frame;

c. a plurality of flexible rods attached to each end of said frames, said rods facing a generally rearward direction with respect to the direction of movement of the mobile structure;

d. oscillating means attached to said at least one tunnel defining member to oscillate a pair of said frames with respect to said at least one tunnel defining member about said spindle so as to cause said rods to contact said vine stocks and shake the grapes therefrom;

e. linkage means connecting said oscillating means to a pair of said frames, and

f. means attached to said mobile structure to move said at least one tunnel defining member laterally with respect to said mobile structure.

3,890,776

WATCH WITH SOLAR CELL UNIT

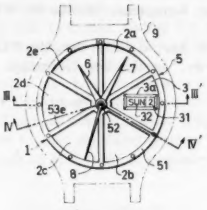
Yoshihisa Urushida, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 26, 1974, Ser. No. 454,988

Claims priority, application Japan, Mar. 27, 1973, 48-36230

Int. Cl. G04c *3/00*; **G04b** *19/06*

U.S. Cl. 58—23 C **5 Claims**



1. In an electronic watch of the type having a solar cell unit comprised of a plurality of separate spaced apart solar cell elements positioned in place of a conventional time display dial, the improvement comprising the provision of a protecting and positioning means for covering the edges of each cell element and separating said elements from each other, said protecting and positioning means comprising an inner ring portion, a plurality of radially extending arms spanning the space between adjacent cell elements and partially overlying the outer surfaces of said cell elements adjacent the edges thereof, an outer peripheral member connecting the outer ends of said arms and partially overlying the outer surfaces of said cell elements along the outer periphery thereof and a dependent rib on the under surface of each of said arms extending in between said cell elements.

3,890,777

DISPLAY DEVICE

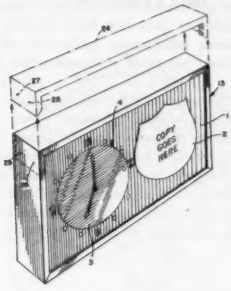
Robert B. Stanish, Chicago, Ill., assignor to Poster Products, Inc., Chicago, Ill.

Filed Nov. 1, 1973, Ser. No. 411,711

Int. Cl. G04b *19/30*, *19/00*

U.S. Cl. 58—50 R **5 Claims**

1. A clock comprising a clock driving mechanism, a first pattern disc rotatable in response to said mechanism including radial transparent sections on an opaque background, a second disc rotatable in response to said mechanism at the rate of one revolution every 12 hours and having a radial transparent section and otherwise being colored with the colored portion being light transmitting, and a third disc rotatable in response to said mechanism at the rate of one revolution every hour and having the same characteristics as the second disc except that it is a different color, said discs being aligned with one another, a light source adapted to produce light rays which are transmitted through said first, second and third



discs in the order named, the second and third discs blocking light everywhere except at locations aligned with one of the transparent sections in the second and third discs so that whenever a transparent section in the second and third disc is aligned with a transparent section on the first disc a colored radially moving flashing illuminated hour and minute hand is presented to the viewer.

3,890,778

WATCH STEM INTERMEDIATE SETTING POSITION WITH FUNCTIONS DETERMINED BY WHETHER INTERMEDIATE POSITION WAS ACHIEVED BY PUSHING STEM IN OR PULLING STEM OUT

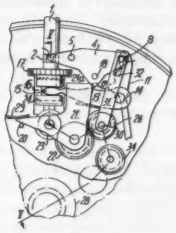
Marc Aeschmann, Geneva, Switzerland, assignor to Ebauches S.A., Switzerland

Filed July 29, 1974, Ser. No. 492,855

Claims priority, application Switzerland, Aug. 2, 1973, 11263/73; July 9, 1974, 9409/74; July 9, 1974, 9410/74

Int. Cl. G04b *23/12*, *19/24*, *27/04*

U.S. Cl. 58—57.5 **13 Claims**



1. In a timepiece including a plurality of indicating members and a device for setting the indications of said members, said device comprising a manually operable rotatable and axially displaceable actuating stem, and means for defining three discrete axial positions of the stem namely a pushed-in position, an intermediate position in which the stem is operatively connected with at least one indicating member for actuation thereof by rotation of the stem, and a pulled-out position, the improvement comprising means for selectively operatively connecting said stem in said intermediate position with a first indicating member in response to pulling out of the stem from the pushed-in position to the intermediate position and with a second indicating member in response to pushing in of the stem from the pulled-out position to the intermediate position.

3,890,779

CHRONOGRAPH WATCH

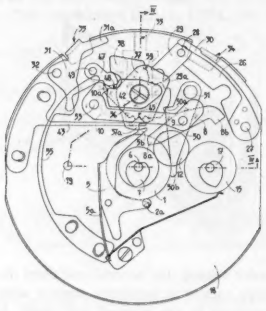
Edmond Capt, and Gerald Gander, both of Le Sentier-Canton of Vaud, Switzerland, assignors to Valjoux S.A., Les Bioux, Switzerland

Filed Apr. 4, 1974, Ser. No. 457,987

Claims priority, application Switzerland, Apr. 6, 1973, 5000/73

Int. Cl. G04f 7/04

U.S. Cl. 58—76 2 Claims



1. A chronograph watch including a frame, a setting stem, return-to-zero hammers and a chronograph mechanism having a cam rotatable about an axis, a first control lever for controlling running and stopping of the chronograph and a second return-to-zero control lever, said cam being controlled by said control levers, said watch comprising, the axis of rotation of the cam intersecting the axis of the stem, said control levers being arranged substantially symmetrically with respect to the axis of said cam and the stem, the return-to-zero hammers including at least a lever independent from said cam, said last named lever being articulated on the frame and being operated by said cam.

3,890,780

BEARING SUPPORT FOR THERMAL POWER ENGINES

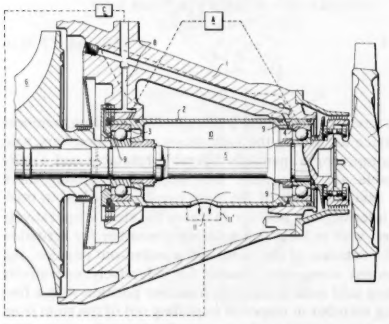
Klaus Hagemeister, Munich, and Josef Wiesbock, Dachau, both of Germany, assignors to Motoren-und Turbinen-Union Munich GmbH, Germany

Filed Aug. 31, 1973, Ser. No. 393,275

Claims priority, application Germany, Aug. 31, 1972, 2242734

Int. Cl. F02c 7/06

U.S. Cl. 60—39.08 24 Claims



1. Apparatus for supporting a high-speed rotor shaft comprising:

first bearing means for directly rotatably suporting said shaft, said first bearing means including a first outer race surrounding roller means of said first bearing means,

second bearing means for directly rotatably supporting said shaft, said second bearing means including a second outer race surrounding roller means of said second bearing means, said second bearing means being engageable with said shaft at a position spaced axially from said first bearing means,

a housing subject to substantial heat loads and disposed in surrounding relationship and spaced radially from said shaft and bearing means at least along the length of the shaft between said bearing means,

lubricant supply means for supplying lubricant to each of said bearing means,

and receiving sleeve means clampingly engaged with and extending between said first and second outer races, said sleeve means being spaced radially inwardly of internal walls of said housing and including lubricant conducting means for conducting lubricant away from each of said bearing means while maintaining said lubricant out of contact with said internal walls of said housing such that any heating up of the lubricant at said internal walls is prevented.

3,890,781

FLUID COOLED COMBUSTION CHAMBER CONSTRUCTION

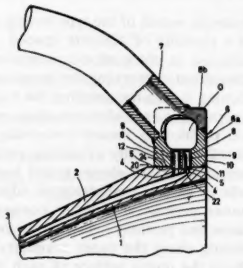
Günther Schmidt, Asteinweig 21, 8012 Ottobrunn-Riemerling; Armin Theiss, Neusatzerstrasse 6a, 8 Munich 82; Dederra, Carl-Helmut, Mozartstrasse 87a, 8012 Ottobrunn, and Leonhard Kaiser, Kemptener Strasse 60, 8 Munich 49, all of Germany

Filed Apr. 4, 1969, Ser. No. 813,677

Claims priority, application Germany, Apr. 18, 1968, 1751180

Int. Cl. F02k 11/02

U.S. Cl. 60—267 6 Claims



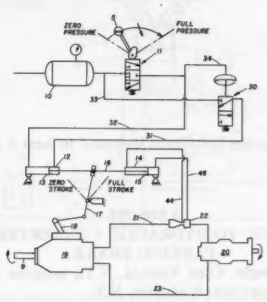
1. A construction for a combustion chamber having a fluid cooled wall, comprising a combustion chamber wall having a cooling duct defined therethrough and being made of a relatively soft material, said wall having an annular ring mouting base defined on the exterior thereof overlying said duct, at least one bore defined through said wall from the exterior of said ring mounting base into said duct, and a closed annular ring conduit, of a structurally strong material such as steel, surrounding said wall and having an exterior annular ring base overlying said mounting base and at least one ring bore aligned with the bore of said wall.

3,890,782

VARIABLE SET POINT SPEED CONTROL FOR HYDROSTATIC TRANSMISSIONS

Warren C. Wauson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 19, 1974, Ser. No. 498,810
Int. Cl. F16h 39/46
U.S. Cl. 60—327 16 Claims



1. A control system for hydraulic transmissions having a variable displacement pump driving a hydraulic motor in a hydraulic system comprising:

a regulated air pressure signal;

sensing means in said hydraulic system for creating a fluid pressure signal responsive to the flow of hydraulic fluid in said hydraulic system;

two opposing pistons, one being responsive to said regulated air signal and the other being responsive to the fluid pressure signal of said sensing means; and

means responsive to said opposing pistons for controlling the displacement of said variable displacement pump.

3,890,783

DUAL PRESSURE CONTROL ASSEMBLY

Thomas E. Allen, Mustang, and Don W. Smith, Edmond, both of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

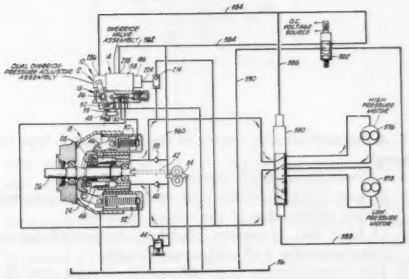
Filed Apr. 1, 1974, Ser. No. 456,843
Int. Cl. F16h 39/46
U.S. Cl. 60—420 9 Claims

1. In a hydrostatic transmission system of the type which includes a hydraulically servo controlled variable displacement pump which selectively provides pressurized hydraulic fluid to either of two loads having higher and lower maximum working pressures, respectively, a control valve assembly for directing pressurized control fluid to said servo controlled variable displacement pump to vary the swashplate angle of the pump in response to an external control signal, and a source of pressurized control fluid for providing pressurized control fluid to the control valve assembly, the improvement comprising:

override valve assembly means interposed between the source of pressurized control fluid and the control valve assembly for reducing the flow of pressurized control fluid therethrough to the control valve assembly to reduce the swashplate angle of the pump when the maximum working pressure of either load is exceeded, said override valve assembly means including a slidable spool valve member carried therein and having first and second ends, a conduit communicating between the first end of the spool valve member and the pressurized hydraulic fluid from the variable displacement pump, spring means operatively engaging the second end of the spool valve member for biasing the spool valve member against the pressure of the pressurized hydraulic fluid from the variable displacement pump whereby the override valve assembly means provides substantially unrestricted flow of pressurized control fluid therethrough when the maximum working pressure of either load is not exceeded;

override conduit means interconnecting the source of pressurized control fluid and said override valve assembly means for providing pressurized control fluid to said override valve assembly from the source of pressurized control fluid;

a dual override pressure adjustor assembly carried by said override valve assembly means and including a body assembly carried by said override valve assembly means, piston means slidably disposed within the body assembly with one end portion thereof operatively engaging the spring means of said override valve assembly means, and a port formed in the body assembly communicating with the opposite end portion of the piston means;



control valve means for alternately selecting, in response to stimulus external thereto, one of the two loads to which pressurized hydraulic fluid is provided by the variable displacement pump;

first dual override conduit means for interconnecting the source of pressurized control fluid and said control valve means;

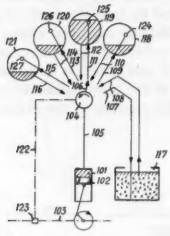
second dual override conduit means for interconnecting the port in the body assembly of said dual override pressure adjustor assembly and said control valve means; and

valve member means in said control valve means intermediate said first and second dual override conduit means for placing the piston means in fluid communication with the source of pressurized control fluid to increase the bias of the spring means on the spool valve member against the pressure of the hydraulic fluid from the variable displacement pump when the variable displacement pump is providing pressurized hydraulic fluid to the load having the higher maximum working pressure and, ultimately, blocking fluid communication between the source of pressurized control fluid and the piston means to decrease the bias of the spring means on the spool valve member against the pressure of the hydraulic fluid from the variable displacement pump when the variable displacement pump is providing pressurized hydraulic fluid to the load having the lower maximum working pressure, said valve member means being responsive to stimulus external to said control valve means.

3,890,784
THERMOHYDRAULIC ENGINES

Jean André Georges Tubeuc, Le Chesnay, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Apr. 23, 1974, Ser. No. 463,381
Claims priority, application France, Apr. 26, 1973, 73.15990; Apr. 26, 1973, 73.15991; Apr. 26, 1973, 73.15992; Apr. 26, 1973, 73.15993; Apr. 26, 1973, 73.15994
Int. Cl. F03c 1/00
U.S. Cl. 60—516 13 Claims



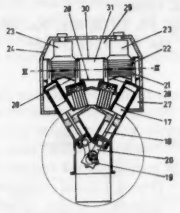
1. A thermohydraulic engine of the liquid piston type comprising:
a. a power output shaft member;
b. at least one compartment of variable volume coupled in driving relationship to the output member;
c. at least two expansion chambers connected for fluid communication with said compartment;
d. said compartment to be filled and at least one of the expansion chambers to be partially filled with a liquid during use of the engine, said liquid defining a wall of said chambers; and
e. means in each of said expansion chambers for introducing a product capable of producing energy by its expansion, into said selected one of said two expansion chambers in direct contact with said liquid in said chamber when the liquid therein has substantially reached a predetermined level;
f. the number of said compartments of variable volume being less than twice the number of said expansion chambers, and
g. conduit means for leading said liquid which has been contacted with said product from said chambers to a liquid receiver, whereby components of said product are carried to said receiver in said liquid.

3,890,785
STIRLING CYCLE ENGINE WITH COMMON HEAT EXCHANGER HOUSING

Bo Goran Torsten, Torstensson, Ginstgatan, Sweden, assignor to Kommanditbolaget United Stirling AB & Co., Malmo, Sweden

Filed Feb. 16, 1973, Ser. No. 333,326
Claims priority, application United Kingdom, Feb. 19, 1972, 7802/72
Int. Cl. F02g 1/04
U.S. Cl. 60—525 6 Claims

1. A multi-cylinder double-acting Stirling cycle hot gas engine of compact V-configuration having a single crank shaft comprising in combination, eight cylinders each with adjacent regenerator-cooler units arranged in two lines of four, means connecting each line of cylinders to contain gas charges circulating only within the respective line of four cylinders, and a

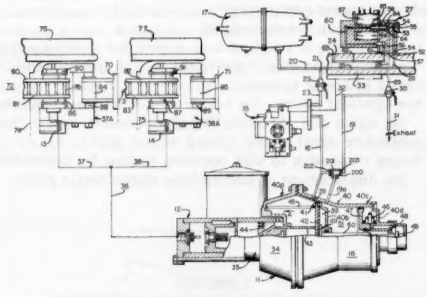


plurality of burner units each disposed to heat a plurality of said cylinders.

3,890,786
PNEUMATIC TO HYDRAULIC CONVERTER WITH PARKING BRAKE

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,533
Int. Cl. F15b 7/08
U.S. Cl. 60—547 10 Claims



1. A pneumatic to hydraulic converter for actuating hydraulic brakes with a pneumatic control system comprising
a. a first fluid responsive pneumatic motor means, said first pneumatic motor being responsive to positive variations in fluid pressure to actuate a first hydraulic master cylinder.
b. a spring applied fluid released motor means restrained by a second pneumatic motor means, said spring motor means being responsive to reductions in fluid pressure in said second pneumatic motor to actuate said first hydraulic master cylinder.
c. a hydraulic slack adjuster means, said adjuster means comprising a reciprocal piston with first and second working chambers on either side of said piston, said first working space communicating with said first hydraulic master cylinder, said second working space communicating with said hydraulic brakes, said slack adjuster means having first and second stop means for limiting the reciprocation of said piston,
d. transfer valve means for permitting the transfer of hydraulic fluid from said first working space to said second working space when said piston abuts said first stop means, said valve also permitting the transfer of hydraulic fluid from said second working space to said first working space upon a predetermined differential in hydraulic pressure between said first and second spaces.

3,890,787

METHOD AND MEANS FOR HEATING BUILDINGS IN A DISTRICT HEATING SYSTEM WITH WASTE HEAT FROM A THERMAL POWER PLANT

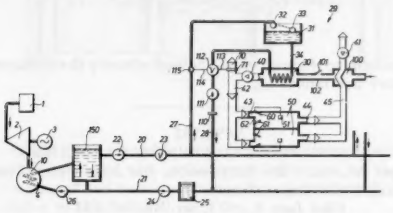
Peter Heinrich Erwin Margen, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Sweden

Filed Mar. 15, 1973, Ser. No. 341,280

Claims priority, application Sweden, Mar. 17, 1972, 3513/72

Int. Cl. F24d 3/04

U.S. Cl. 60—648 27 Claims



21. District heating system including a plurality of buildings containing individual rooms to be heated, comprising a thermal power plant utilizing steam to generate electricity and including a first heat exchanger arranged to receive the steam after it has been used in generating electricity for transferring waste heat from the steam, distribution pipes connected to said first heat exchanger for flowing water from said first heat exchanger after it has passed in heat transfer relation with the steam to the buildings in the district heating system, and return pipes for recirculating the water from the buildings to the first heat exchanger, wherein the improvement comprises a second heat exchanger located in each building, said distribution pipes and return pipes connected to said second heat exchanger for circulating the heated water therethrough, conduit means connected to said second heat exchanger for flowing air therethrough in indirect heat transfer relation with the heated water, first channels connected to said second heat exchanger for conveying heated air to individual rooms in the building, and a second channel connected to said first channels upstream from the point at which they supply air to the individual rooms for conveying heated air to the atmosphere.

3,890,788

HYDROSTATIC DRIVE SYSTEM

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Apr. 24, 1974, Ser. No. 463,443

Int. Cl. F15b 15/18

U.S. Cl. 60—468 7 Claims

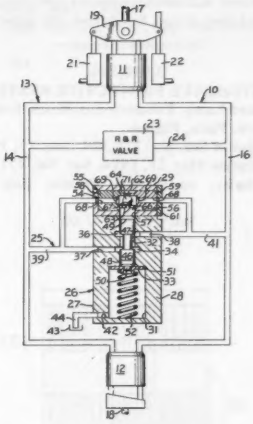
1. A hydrostatic drive system for a vehicle providing precise slow speed control of vehicle movement comprising;

a variable displacement pump;

a hydraulic motor;

a closed hydraulic system interconnecting said pump and said motor for communicating fluid therebetween;

fluid bypass means disposed within said hydraulic system in parallel with said motor including a pressure responsive automatically variable restrictor valve having a passage extending therethrough, a valve member operatively associated with said passage and a spring resiliently urging said valve member to an open position permitting fluid flow through the bypass means for dampening pressure surges and smoothing fluid flow in the hydraulic system at relatively slow vehicle speeds when the fluid flow in the hydraulic system is below a predetermined flow rate and a predetermined pressure value, said restrictor valve being effective to increase the fluid pressure in the closed hydraulic system as the fluid flow through the bypass means increases and responsive to such increased pressure progressively to reduce fluid flow through the bypass means for increasing the speed of the vehicle, and eventually to block such fluid flow through the bypass means when the fluid pressure exceeds said predetermined value to assure delivery of all fluid flow from the pump to the motor at high speeds and at high vehicle load conditions where the fluid pressure remains above said predetermined pressure even though the flow



rate decreases below the predetermined rate at which said restrictor valve is normally opened; and

said restrictor valve including means providing an auxiliary flow path for transmitting fluid under pressure from said closed hydraulic system to said valve member for moving it toward a closed position against the bias of said spring for blocking fluid flow through said passage when the fluid pressure in the hydraulic system exceeds said predetermined value.

3,890,789

THERMAL POWER PLANTS

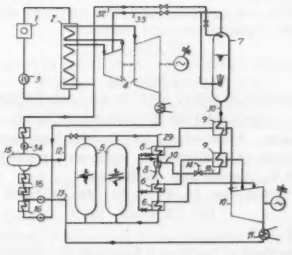
Georg Beckmann, and Paul Viktor Gilli, both of Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Austria

Filed Dec. 6, 1973, Ser. No. 422,413

Claims priority, application Austria, Dec. 7, 1972, 10474/72

Int. Cl. F01k 3/12, 1/14

U.S. Cl. 60—659 14 Claims



1. In a thermal power plant, such as a nuclear power plant, primary circuit means for generating primary power and accumulator circuit means communicating with said primary circuit means for generating additional peak power to be used in addition to the primary power during peak power periods, said accumulator circuit means including a displacement accumu-

lator means for accumulating a reserve of energy during non-peak periods, steam generator means communicating with said displacement accumulator means for generating steam with fluid circulated between said displacement accumulator means and said steam generator means, circulating conduit means communicating with said displacement accumulator means and said steam generator means for circulating the fluid between said steam generator means and said displacement accumulator means, circulating means operatively connected with said circulating conduit means for circulating fluid therethrough, and drive accumulator means operatively connected with said circulating means for driving the latter.

3,890,790

ANTI-HEAVE PROTECTIVE SYSTEM

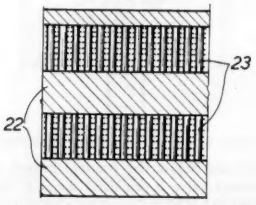
Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to C. J. Doris, Paris, France

Continuation of Ser. No. 324,305, Jan. 17, 1973. This application May 21, 1974, Ser. No. 471,878

Claims priority, application France, Jan. 18, 1972, 72.01560

Int. Cl. E02b *3/06*

U.S. Cl. 61—3 **6 Claims**



1. Protective system against the heaving action of waves of water comprising a bulky obstacle means having a spreading-out surface and providing a substantially uninterrupted impingement area of substantial extent athwart the wave path and exposed to the impact of successive surges of the heave to induce along said spreading-out surface alternate ascending and descending motions of a mass of water of a thickness greater than a limit layer of water, and means providing a multiplicity of energy dissipating material elements distributed over and projecting in front of said spreading-out surface a distance sufficient to penetrate into said mass of water beyond said limit layer, said elements serving to slow down said ascending and descending water motions and phase-shift the same with respect to the heave, in which the obstacle means is constituted by a plurality of separate obstacle members arranged in staggered relation in a direction perpendicular to the spreading-out surface, and the material elements are borne by the separate obstacle members.

3,890,791

METHOD OF BUILDING A TUNNEL AND TUNNEL BUILT ACCORDING TO SAID METHOD

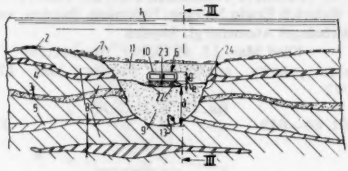
Jan De Koning, Amsterdam, and Romke Van Der Veen, Jutphaas, both of Netherlands, assignors to Ballast-Nedam Group N.V., Amsterdam, Netherlands

Filed Apr. 16, 1973, Ser. No. 351,268

Int. Cl. E02d *29/06*

U.S. Cl. 61—43 **5 Claims**

1. The method of building a tunnel in the bottom of a body of water, which tunnel comprises a series of interconnected tunnel elements, comprising the steps of dredging a tunnel trench in said bottom till a depth which is several times the tunnel height is reached, partially filling said trench with a ballast bed of foundation material to a depth below said bottom but at least twice the height of said tunnel laying the tunnel in the partially filled trench in temporarily supported position above the level of the foundation material, and then completing the filling of said trench with foundation material



substantially to the level of said bottom whereby to encompass and bury said tunnel.

3,890,792

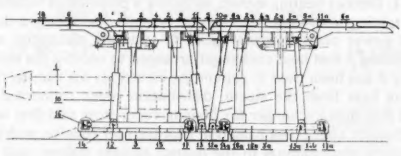
WALKING-PROPS FOR MINING GALLERIES

Georges Alacchi, Villa Saint-Joseph, rue Jules Ferry, Frais Marais 59500 Douai, France

Filed June 5, 1973, Ser. No. 367,132

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 D **9 Claims**



1. A walking-prop system for mining galleries, of the type adapted to be kept in contact with the gallery's roof during shifting and comprising at least a front roof support frame and a rear roof support frame both arranged one behind another in the direction of advance, each of said support frames being constituted by a plurality of double-acting load-bearing props, a shoe carried by the lower-end of said load-bearing props and adapted to contact the floor of the gallery, a cap member connected to the upper end of said load-bearing props and adapted to contact the roof of said gallery, at least one double acting shifting jack disposed between said front and rear support frame and connecting the opposite ends of the cap members of each of said support-frames, wherein each support frame include at least a double acting supporting jack placed in front of the corresponding support-frame and pivotally connected on its upper end to the cap member of said support-frame and on its lower end to a front base shoe in contact with the floor of the gallery and also a double acting supporting jack placed in the rear of the corresponding support-frame and pivotally connected on its upper end to the cap member of the corresponding support-frame and on its lower end to a rear base shoe in contact with the floor of said gallery, and wherein the front base shoe and the rear base shoe of each support-frame are linked together by a connecting jack.

3,890,793

SUPPORT ADVANCING APPARATUS FOR MINES

Manfred Koppers, and Friedhelm Kuhnapfel, both of Duisburg, Germany, assignors to Rheinstahl AG, Germany

Filed Sept. 27, 1974, Ser. No. 510,064

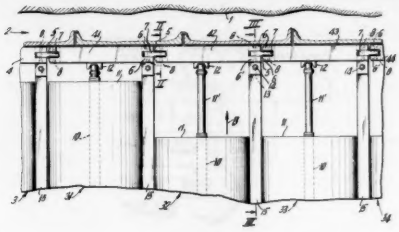
Claims priority, application Germany, Oct. 8, 1973, 2350401

Int. Cl.² E21D *23/00*

U.S. Cl. 61—45 D **7 Claims**

1. An advancing support system for following the dip of a longwall in an underground mine operation, comprising an abutment beam made up of a plurality of individual beam elements arranged in end-to-end axial alignment along the

length of the longwall, connecting means pivotally connecting adjacent individual beams together so that they may pivot substantially only in one plane perpendicular to the footwall,



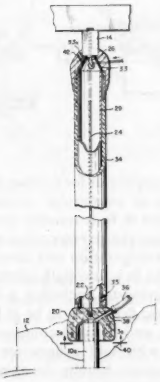
a support unit alongside each individual beam element, and means associated with each support unit connected to respective ones of said individual beams for selectively shifting them relative to said longwall.

3,890,794

METHOD OF REPLACING PILING

John T. Broadfoot, Star Rte. 1, Box 144, Kingston, Wash. 98346

Filed Dec. 26, 1972, Ser. No. 318,093
Int. Cl. E02d *5/26, 5/40*
U.S. Cl. 61—54 **10 Claims**



1. A method of providing a load-bearing, cast-in-situ concrete piling, comprising:

providing a concrete base member adapted to be secured to a sound bottom piling stub whose upper end is just below the mud line;

securing an elongated, hollow, concrete form tube to the top of the base member;

applying a layer of quick-setting concrete completely over the outer surface of the form tube and its intersection with the base member of sufficient thickness to form a hollow, load-bearing concrete column;

suspending the base member and hollow column in the water above and over the piling stub;

lowering the integral base and column into contact with the piling stub;

securing the base to the piling stub; and

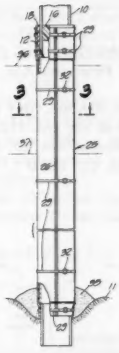
securing the upper end of the column to an overhead support member, the elongated, hollow, concrete form tube extending from the base member to just below the overhead member so as to form a continuous load-bearing concrete column extending from the piling stub to just below the overhead member.

3,890,795

KIT OF COMPONENTS AND A METHOD OF PROTECTING STEEL PILING FROM CORROSION

John R. Maurer, Glendora, Calif., assignor to Walter A. Plummer, Sherman Oaks, Calif.

Filed May 21, 1973, Ser. No. 362,170
Int. Cl. E02d *5/60*
U.S. Cl. 61—54 **13 Claims**



1. That method of protecting H-beam steel piling against corrosion which comprises: mounting elongated non-metallic corner protector means lengthwise of each outer longitudinal corner of the piling, securing barrier blocks into the opposite sides of the piling adjacent the upper ends of said corner protector means to seal the entrance to the space disposed on the opposite sides of the pile web and in an area spaced above high water level, applying a resilient sealing collar about said piling radially opposite said barrier blocks, sheathing said piling opposite said collar and therebelow with a substantially fluid-tight jacket of supple sheet plastic, securing said plastic jacket snugly about said piling and corner protector means and in a fluid-tight manner about said sealing collar thereby to exclude oxygen and preventing corrosion of the piling.

3,890,796

METHOD FOR REMOVING LIQUID CONTAMINANTS FROM A SUBMERGED TANK

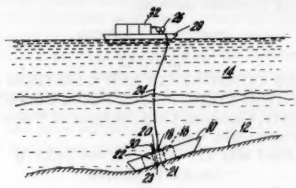
Jean J. Kruger, Northport, N.Y., and Vincent E. Rositto, 58 Higbie La., West Islip, N.Y. 11795, assignors to said Vincent E) Rossitto by said Jean J. Kruger

Division of Ser. No. 231,631, March 3, 1972, Pat. No. 3,813,887. This application Dec. 26, 1973, Ser. No. 427,786
Int. Cl.² **B63C** *7/12, 11/40*
U.S. Cl. 61—69 **8 Claims**

1. A method of removing liquid material from a submerged tank comprising the steps of:

drilling a first hole and drilling a second hole in the submerged tank while the tank is submerged and while the drill and at least each area of the tank being drilled is isolated from the liquid in which the tank is submerged as such area is drilled so as to prevent the liquid material in the tank from escaping, during drilling, into and contaminating the liquid surrounding the tank, said first hole

being positioned higher than said second hole; and pumping the liquid material out from one of said first and



second holes, while liquid surrounding the submerged tank enters the other of said holes.

3,890,797

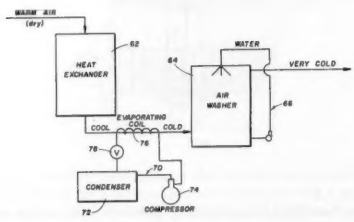
AIR CONDITIONING PROCESS

Ted R. Brown, 1212 Princeton Ave., Salt Lake City, Utah 84105

Division of Ser. No. 359,368, May 11, 1973, which is a continuation-in-part of Ser. No. 172,968, Aug. 19, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,527

Int. Cl.[2] F25D *17/06*

U.S. Cl. 62—91 **2 Claims**



1. A process for controlling the temperature and moisture content of air having a dew point of not more than 57°F corresponding to at least 90°F dry bulb temperature, sequentially

preparing an air flow path accommodating 400-600 CFM/ton net sensible cooling;

drawing fresh dry air exclusively from a fresh air source and through the flow path in the amounts of 400 to 600 CFM/ton net sensible cooling;

pre-cooling the fresh air with a heat exchanger without altering its moisture content;

refrigerating the pre-cooled air to further cool the air and coincidentally condense excess moisture; and

scrubbing the cooled air with recirculating water to adiabatically cool the air to within a range of 53° to 60°F.

3,890,798

REFRIGERATOR CONTROL APPARATUS

Ryoichi Fujimoto, Tochigi-ken; Kazuo Takasugi, Higashiyamato; Fumiyuki Inose; Kenji Maio, both of Kokubunji, and Norio Yokozawa, Fuchu, all of Japan, assignors to Hitachi, Ltd., Japan

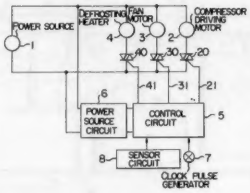
Filed Aug. 12, 1974, Ser. No. 496,897

Claims priority, application Japan, Nov. 5, 1973, 48-123436

Int. Cl. F25d *21/06*

U.S. Cl. 62—155 **6 Claims**

1. A refrigerator control apparatus comprising: an electronic timer including first, second and third counters, a clock signal being applied to the input stage of said first counter, the output of said first counter being applied to the input stage of said second counter; means for picking up a first timing signal from a predetermined stage of said first counter; means for picking up a second timing signal from the output stage of said second counter; means for picking up a third timing signal from the output stage of said third counter; means for controlling the overload time of a compressor in response to said first timing signal; means for controlling the suspension time of



said compressor in response to said second timing signal; means for controlling the defrosting suspension time in response to said third timing signal; and means for applying the output of said first counter to said third counter during the running time of said compressor.

3,890,799

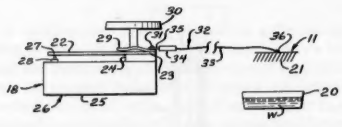
BIMETAL THERMOSTAT DEFROST AND AIR TEMPERATURE CONTROL

George William Sisk, Jr., Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 8, 1974, Ser. No. 449,283

Int. Cl. F25b *1/00*

U.S. Cl. 62—215 **16 Claims**



1. In a refrigeration apparatus for cooling air having a refrigeration unit including an evaporator means and means for flowing air to be cooled in heat transfer association with the evaporator means, temperature responsive means for controlling operation of said refrigeration unit comprising: means for flowing air to be cooled in a flow path substantially bypassing said evaporator; a thermostat including a bimetal actuating element disposed in said flow path to be in heat transfer relationship with said air; and thermal conductor means in heat transfer relationship with said evaporator means and said bimetal actuating element whereby the thermostat is responsive to the frost condition of the evaporator means and the temperature of bypassed air.

3,890,800

SAFETY RESILIENT SLIP COUPLING FOR PIERCED EARRINGS

Donald J. Montague, Casilla 3714, Lima, Peru

Filed Oct. 9, 1973, Ser. No. 404,848

Int. Cl. A44c *7/00*

U.S. Cl. 63—13 **10 Claims**

1. A pierced earring having a safety coupling comprising:

an elongated spring member formed into a loop for insertion through an aperture in an earlobe;

an earring ornament; and,

means for supporting said ornament from said loop, said ornament supporting means being secured to said earring ornament and being automatically operable under tension between said loop and said earring ornament downwardly away from the portion of said loop that normally

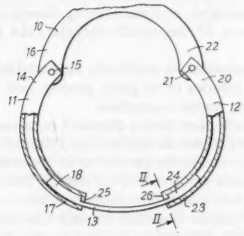
rests in the earlobe aperture to separate said loop from said ornament supporting means thereby eliminating

tension on the loop and protecting the earlobe from damage.

3,890,801
ADJUSTABLE RING-SHAPED ARTICLES OF JEWELRY

Jacob Newman, 85 Hatton Grdn., London, England

Filed Jan. 2, 1974, Ser. No. 429,718
Int. Cl. A44c 9/02
U.S. Cl. 63—15.65 **7 Claims**

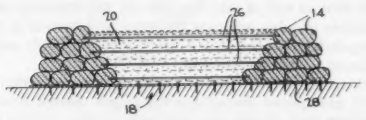


1. A ring-shaped article of jewelry comprising:
a base;
two arcuate links, each link pivotally connected to opposite sides of said base for angular movement about an axis parallel to the axis of said ring-shaped article, wherein each of said links comprises an arcuate tube having a cross section which has a flat side turned outward at the end of each of said tubes remote from said base to form abutments;
a resilient strip having a cross section which has a flat side and having its ends telescopically mounted one in each of said tubes, the strip being telescopically movable relative to said links by pressure to adjust the internal dimensions of the article, the center portion of such strip between said ends being cut away along its flat sides so that the end portions are larger than its center portion, said end portions being a close sliding fit within said tubes, the abutments on said tubes forming a close sliding fit against the flat side of the center portion of the strip and engaging the larger end portions of said strip when the article is expanded to its maximum size thereby preventing withdrawal of the strip from the tube said close sliding fits of said end portions within said tubes and between said abutments and said flat side of said center portion providing means affording sufficient frictional resistance to prevent relative movement of said links and strip out of adjusted position during normal use.

3,890,802
REINFORCED DIKE

Edouard Auriat, Montrouge, and Yves Gaudard, Lyon, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Apr. 6, 1973, Ser. No. 348,473
Claims priority, application France, Apr. 24, 1972, 72.14763
Int. Cl. E02b 7/02
U.S. Cl. 61—30 **15 Claims**

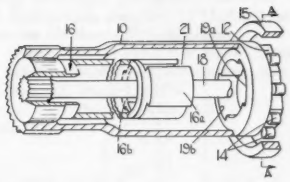


7. The dike as recited in claim 1 wherein said porous reinforcing element is a non-woven sheet of continuous filaments.

3,890,803
TORQUE TRANSMITTING DEVICE WITH TORQUE LIMITING DEVICE

Francis John Neal, and John Richard Simmons, both of Wolverhampton, England, assignors to Lucas Aerospace Limited, Birmingham, England

Filed Jan. 28, 1974, Ser. No. 437,481
Claims priority, application United Kingdom, Feb. 3, 1973, 5466/73
Int. Cl. F16d 3/14
U.S. Cl. 64—27 B **12 Claims**



1. A torque transmitting device comprising an input drive member, a co-axial output drive member, first and second coupling members through which torque is transmitted from the input drive member to the output drive member, said coupling members each having abutment means engageable with both the input drive member and the output drive member, said coupling members being interengaged to permit limited relative angular movement therebetween about the common axis of the input and output members, pre-stressed torsion means applying a torque load to the coupling members in opposite directions to urge these to a limiting angular position relative to one another, whereby when the torque applied to the input drive member in either direction exceeds the pre-stressing of the torsion means, the drive members are moved relative to one another, and a brake actuable on such relative movement of the drive members to prevent turning thereof.

3,890,804
KNITTING MACHINES

Norberto Puig Anglada, Puigblanch St. Nr. 22, Mataro, Barcelona, Spain

Continuation-in-part of Ser. No. 190,115, Oct. 18, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 426,548
Claims priority, application Spain, Nov. 25, 1970, 386160
Int. Cl. D04b 15/68
U.S. Cl. 66—50 R **7 Claims**

1. In a circular knitting machine comprising a cylinder housing having a plurality of elongated slots formed therein

and extending longitudinally thereof, and a plurality of pattern control linkages associated with said slots for controlling the knitting pattern of said machine, the improvement wherein each of said linkages includes:

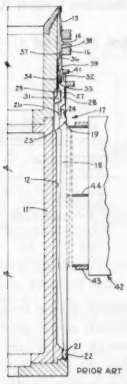
an elongated rodlike control element formed as an elongated resiliently flexible member and disposed within and extending substantially longitudinally along a respective slot, one end of said flexible member being fixedly and stationarily anchored relative to said cylinder housing, the remainder of said flexible member being spaced from the bottom wall of said slot whereby the extremity of said flexible member adjacent the other end thereof is freely angularly displaceable in a direction substantially perpendicular to said bottom wall;

an elongated selector jack member positioned within said slot and spaced throughout the length thereof from the bottom wall of said slot, said jack member having hook means on the opposite ends thereof;

projection means fixedly mounted on one of said members intermediate the ends thereof and projecting transversely toward the other of said members, the other of said members having an intermediate portion thereof disposed in bearing engagement with said projection means;

pivot means mounting said selector jack member on said cylinder housing for permitting said jack member to pivotally swing about either end thereof for causing displacement of the extremity of said flexible member in a direction substantially perpendicular to the bottom wall of said slot in response to an external pushing force imposed on said selector jack member, said pivot means including a pair of pivot members mounted on said cylinder housing, one of said pivot members being engaged with each of said hook means; and

said selector jack member having lug means disposed for actuation by an external pattern control projection, whereby a pushing force exerted on said selector jack member adjacent one end thereof is translated to said flexible member due to pivoting of said jack member about the other end thereof, and whereby a pushing force exerted on said selector jack member adjacent said other end thereof is translated to said flexible member due to pivoting of said jack member about said one end thereof.



3,890,805

NEEDLE SELECTION DEVICE FOR A CIRCULAR KNITTING MACHINE

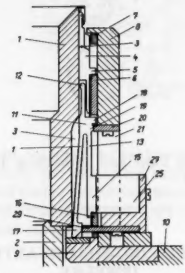
Norbert Paul Bourgeois, Troyes, France, assignor to Etudes et Bonneterie S.A., Nyon, Switzerland

Filed Apr. 2, 1973, Ser. No. 346,793

Claims priority, application Switzerland, Apr. 4, 1972, 4911/72

Int. Cl. D04b *15/66, 15/68, 15/78*

U.S. Cl. 66—50 R **2 Claims**



1. A device for the selection of knitting accessories such as needles of a circular knitting machine including a needle cylinder and at least one selection station on a fixed part of said machine surrounding the needle cylinder and pivotal jacks associated with the accessories to be controlled, each jack and an associated accessory being disposed in a respective guide groove of the needle cylinder, the improvement wherein:

each jack comprises an elastically deformable part located facing the interior of its guide groove, and

each selection station comprises:

magnetic selection means disposed on a cam-box of the machine exterior to said needle cylinder;

means for pivoting the pivotal jacks towards the exterior of the guide grooves and submitting them to the influence of said magnetic selection means;

a bearing surface disposed on said cam-box exterior to said needle cylinder for bearing against the jacks which are submitted to the influence of said magnetic selection means;

a thrust member fixed on said cam-box for acting on said elastically deformable part of each jack and deforming it in a direction towards the interior of its guide groove against the force of attraction of said magnetic selection means; and

said magnetic selection means being situated between said bearing surface and said thrust member.

3,890,806

ELECTRICAL PATTERNING SYSTEM FOR CIRCULAR KNITTING MACHINES

Gerhard Grozinger, Spaichingen, Wurtt, Germany, assignor to Mayer & Cie. Maschinenfabrik, Tailfingen, Wurtt, Germany

Continuation-in-part of Ser. No. 94,365, Dec. 2, 1970. This application June 5, 1972, Ser. No. 259,818

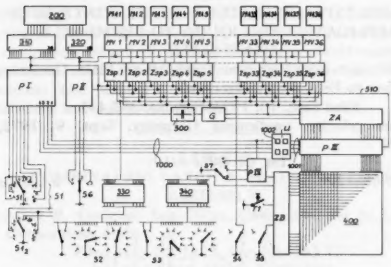
Claims priority, application Germany, June 3, 1971, 2127561

Int. Cl. D04b *15/78*

U.S. Cl. 66—50 R **23 Claims**

8. In a control system for a circular knitting machine which has a plurality of knitting stations respectively associated with different pattern characteristics and together arranged to effect knitting of a patterned fabric composed of fabric units each having one of said pattern characteristics, the combination comprising a pluraility of information locations each corresponding to a respective fabric unit to be knitted and each

arranged to receive and store information representing the pattern characteristic selected for the corresponding fabric unit, said information locations being organized into information location groups scanning means for scanning said locations and for generating groups of pattern signals, each group of signals indicating which locations store information representing a respective one of said pattern characteristics, said scanning means being operative for scanning each of said information location groups, prior to the scanning of the next group, a number of times equal to the number of different pattern characteristics represented by said information, and routing means for establishing a plurality of different selectable routing schemes according to each one of which each of said groups of signals is routed to a respective knitting station



associated with one of said pattern characteristics, and including selecting means for selecting a routing scheme from said plurality of different routing schemes, said routing means and selecting means thereby making it possible to preserve the geometry of a particular pattern while changing the assignment of pattern characteristics within such pattern, said knitting machine having a plurality of buffer stores each associated with a respective one of said knitting stations, and wherein said routing means comprises means for establishing the sequence in which successive ones of said buffer stores are permitted to receive pattern signals, and for establishing the sequence in which successive groups of pattern signals are presented to buffer stores, and wherein said selecting means comprises means for altering at least one of said sequences.

3,890,807

DRIVING MECHANISM FOR KNITTING NEEDLE DISPLACEMENT IN WARP KNITTING MACHINES, SUCH AS RASCHEL MACHINES, PARTICULARLY

Johannes Socha, Monchen-Gladbach, and Wolfgang Groth, Rheydt, both of Germany, assignors to W. Schlafhorst & Co., Maschinenfabrik, Monchen-Gladbach, Germany

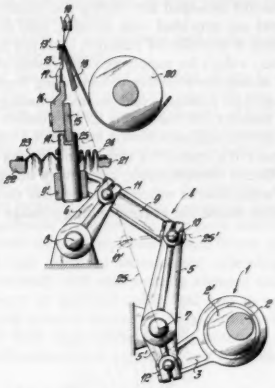
Filed Dec. 3, 1973, Ser. No. 420,795

Claims priority, application Germany, Dec. 2, 1972, 2259170

Int. Cl. D04b *23/00*

U.S. Cl. 66—86 R **4 Claims**

1. Drive means to provide a tilting motion in addition to an up and down motion to knitting needles, comprising a crank drive, including a crank shaft, a first frame mounted rocker arm connected to the crank shaft, a link member having one end connected to the other end of said first rocker arm, a second frame mounted rocker arm pivotally connected to an intermediate point on said link, a carrier of knitting needles rigidly connected to the other end of said link at an angle of 110° to 160° to the axis of said link, the lengths of said crank



shaft, rocker arms and link being chosen to impart an up and down motion and a tilting motion to said carrier.

3,890,808

DEVICE ON A FLAT KNITTING MACHINE FOR INSERTING A DESIGN

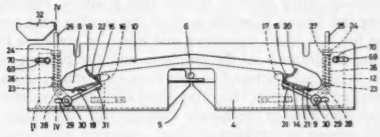
Heintz Züllig, Wettingen, and Robert Leutwyler, Regensdorf, both of Switzerland, assignors to Madag Maschinen- und Apparatebau Dietikon AG, Switzerland

Filed Aug. 19, 1974, Ser. No. 497,785

Claims priority, application Switzerland, Aug. 21, 1973, 12028/73; Feb. 22, 1974, 2565/74

Int. Cl. D04b *15/52*

U.S. Cl. 66—127 **13 Claims**



1. A device on a flat knitting machine for inserting a design thread, said device having a nut mounted in a movable lock for the main thread and a thread guide fastened into the apparatus base for the main and design threads, comprising:

means for stretching said design thread;

two hold-back agents for said stretched design thread, said agents arranged on both sides of said nut in the direction of movement of said lock;

a selector shaft guide connecting said agents and passing next to said nut;

means for freeing said design thread from said hold-back agents depending upon the direction of movement of said lock.

3,890,809

CIRCULAR KNITTING MACHINE WITH PNEUMATIC THREAD FEEDING DEVICES

Riccardo Tenconi, Via Tallera, 20, Varese, Italy (21100)

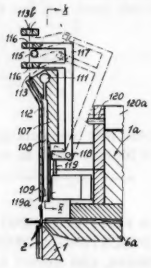
Filed Feb. 20, 1973, Ser. No. 334,164

Int. Cl. D04b *15/58, 15/60*

U.S. Cl. 66—132 R **1 Claim**

1. In a circular knitting machine for manufacturing open tubular fabric having a fixed needle cylinder and cams rotat-

able around said needle cylinder, the needle cylinder having needles arranged along an arc thereof and a zone free of needles extending along the remaining arc thereof, thread feed devices arranged rotatably around said needle cylinder and cutting means arranged for cutting the knitted thread at the end of said arc provided with needles, said feed devices each comprising a plurality of passages directed towards the needle cylinder, a duct for supplying compressed air into said passages and means for selectively controlling feeding of said threads through said passages, said means including a plurality of levers in a number corresponding to the number of threads of each feed device and each having two spaced arms extending into the path of a respective thread and having eyelets for passing said thread therethrough, said levers being pivotable between a first position in which the respective thread is held in a rest position inside the corresponding passage withdrawn



from the path of the needles and a second position in which the respective thread is held in an operative position projecting from said passages into the path of the needles, a fixed stop member arranged between said arms to form loops of the thread around said fixed stop member and said eyelets when the corresponding lever is in said first position, thereby retracting the thread from the path of the needles, and control means for selectively operating said levers in response to the working programme of the machine and the pattern of the article to be manufactured to pass from said first position into said second position or viceversa when said feed devices travel through said zone of the needle cylinder free of needles, said control means comprising pushers engaging said levers at opposite sides of their pivoting points and electromagnetical actuation means responsive to the working programme of the machine for controlling said pushers.

3,890,810

APPARATUS FOR MONITORING A THREAD OR THE LIKE

Rene Domig, Kusnacht, Switzerland, assignor to Aktiengesellschaft Gebruder Loepfe, Zurich, Switzerland

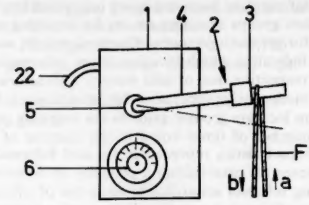
Filed Mar. 18, 1974, Ser. No. 452,993

Claims priority, application Sweden, Mar. 30, 1973, 734594

Int. Cl. D04b *35/14*

U.S. Cl. 66—161 **9 Claims**

1. An apparatus for monitoring the travel and tension of a thread or the like preferably at a textile machine, comprising a guide element, means for holding the guide element by means of a counter force against a tension force normally exerted by the thread in a position in which the thread is in contact with the guide element, but in the presence of an impermissibly high tension force prevailing at the thread said guide element releases the thread, said guide element being equipped with a tribo-electric transducer, said tribo-electric transducer embodying a substantially elongate contact body equipped with a lengthwise bore and an electrode arranged in said lengthwise bore, said tribo-electric transducer upon release of the thread from the contact body or upon standstill of



the thread generating an electrical signal serving to trigger a predetermined operation.

3,890,811

PADDER-TYPE APPARATUS FOR THE CONTINUOUS APPLICATION OF LIQUIDS TO PERMEABLE MATERIALS

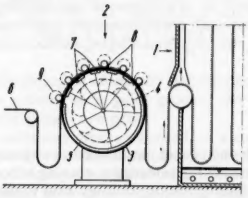
Hans Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa AG, Switzerland

Filed Sept. 10, 1973, Ser. No. 395,441

Claims priority, application Germany, Sept. 9, 1972, 2244272

Int. Cl. B05c *1/10*

U.S. Cl. 68—200 **6 Claims**



1. A padder-type apparatus for the continuous application of liquid to permeable, thick voluminous, web-shaped materials including tufted carpets and needled-felt carpets, plush and the like textile material, said apparatus comprising at least one sieve drum means having a gas-permeable surface with an operating width for supporting and for conveying the material to be wetted with said liquid, said sieve drum means having an interior placed under a suction draft and means within said interior for defining a plurality of series-disposed, narrow, suction zones extending across the operating width of said sieve drum means, and a plurality of printing stencil means each operatively associated with one of said suction zones positioned on one side of the material conveyed across said zones for applying said liquid thereto, whereby said liquid is drawn into the material by an intense suction draft applied at said suction zones.

3,890,812

PLASTIC WASHBOARD

William V. Sunday, 9904 Manor Ave., Cleveland, Ohio 44102

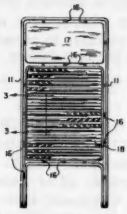
Filed May 10, 1974, Ser. No. 468,749

Int. Cl. D06f *3/02*

U.S. Cl. 68—224 **7 Claims**

1. A unitary synthetic plastic washboard consisting of a U-shape outer rim having a longer dimension and a shorter dimension; said longer dimension including two parallel outer side members; a cross member connected between said side members at the top; two intermediate cross members connected between said side members parallel to said first named cross member, one nearer the top and the other nearer the bottom of said U-shape rim; a washboard structure of alternat-

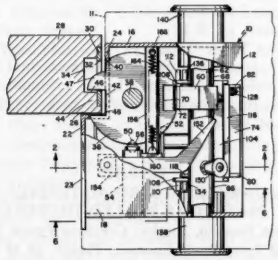
ing parallel ridges and grooves completely filling the space between said intermediate cross members and said outer side members; said side members extending below said lower intermediate cross member and forming legs there; a soapdish bottom connected between said top cross member and said upper intermediate cross member and said outer side members; all of said outer side members and said cross members being of channel shape having parallel walls all terminating at a common level and all opening at one face of said washboard; and cross braces in said channel shapes connected crosswise between said parallel walls at spaced point along said side members and said cross members.



3,890,813
COMBINATION LATCH & DEAD BOLT LOCK ASSEMBLY

Lawson B. Cothron, San Diego, Calif., assignor to Labann Corporation, Calif.

Filed May 24, 1973, Ser. No. 363,733
Int. Cl.² E05B *65/10;* **E05C** *3/02*
U.S. Cl. 70—92 **3 Claims**



1. A combination latch and dead bolt lock assembly, comprising:

a lock unit for attachment to one portion of a structure and a striker for attachment to another portion of a structure to be locked in the first portion;

said lock having a frame;

a disc latch element mounted in said frame for rotation about an axis substantially perpendicular to the direction of motion of the striker relative to the adjacent lock unit; an edge portion of said latch element having a locking notch therein and another edge portion having latching notch therein to receive and retain a portion of said striker, said latching notch being disposed at an angle to the corresponding radious of the disc latch element and defining a tongue portion with the adjacent edge portion of the latching element to engage said striker in the locked position;

a locking element rotatably mounted in said frame on an axis substantially perpendicular to said latch element axis and having a portion engageable in said locking notch to lock the latter against rotation;

a spring means capable of biasing said locking element against said disc latch element whereby upon rotation of said disc latch element into locked position, said locking element engages said locking notch;

a means of disengaging said locking element from said disc latching element; and

retaining means for maintaining said locking element clear of said latching element;

means for disengaging said retaining means to render same ineffective, whereby said lock assembly can be rendered inoperable to permit free movement of said one portion relative to said other portion of said structure; and

said locking element being mounted on a shaft journalled in said frame and said shaft has a radially projecting bearing element, and said means of disengaging said locking element includes an externally projecting panic bolt manually operable from outside said lock unit comprising a rod axially slidably mounted on said frame and having an angled arm mounted thereto and extending therefrom into proximity with said bearing element such that axial movement of said rod cause said arm to angularly displace said bearing element to rotate said locking element on said shaft clear of said locking notch.

2. A combination latch and dead bolt lock assembly comprising:

a lock unit for attachment to one portion of a structure and a striker for attachment to another portion of a structure to be locked in the first portion;

said lock having a frame;

a disc latch element mounted in said frame for rotation about an axis substantially perpendicular to the direction of motion of the striker relative to the adjacent lock unit; an edge portion of said latch element having a latching notch therein to receive and retain a portion of said striker, said latching notch being disposed at an angle to the corresponding radius of the disc latch element and defining a tongue portion with the adjacent edge portion of the latch element to engage said striker in the locked position;

a locking element rotatably mounted in said frame and having a portion engageable with said latch element to lock the latter against rotation;

a spring means capable of biasing said locking element against said disc latch element whereby upon rotation of said disc latch element into locked position, said locking element engages said latch element;

a means of disengaging said locking element from said disc latch element comprising at least one key operated lock operatively connected to said locking element and capable of rotating said locking element against the bias of said spring means; and

a brace capable of holding open said locking element to prevent engagement of said latch element by said locking element, said brace being actuated upon disengagement of said latch element by said key-operated lock.

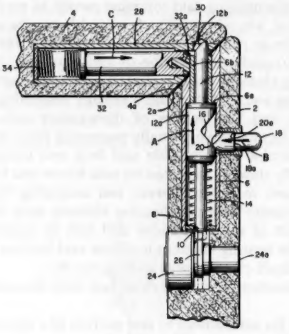
3,890,814
PUSHBUTTON LOCKSET MECHANISM

Marco Fantoni, Udine, Italy, assignor to McClure Furniture Industries, Inc., Milton, Pa.

Filed Aug. 28, 1974, Ser. No. 501,333
Claims priority, application Italy, Sept. 21, 1973, 83427/73
Int. Cl.² E05B *63/22;* **E05F** *1/10*
U.S. Cl. 70—106 **7 Claims**

1. Locking apparatus for furniture articles and the like, comprising: a first elongated member; first means mounting said first member to a first furniture panel for movement along the longitudinal axis of said first member; a second elongated member; second means mounting said second member to a second furniture panel for movement along the longitudinal axis of said second member; first biasing means urging said first member into locking engagement with said second mounting means for locking said first and second furniture

panels against relative movement; second biasing means urging said second member into engagement with said first mounting means; and means coupled to said first member for moving said first member in a direction opposite to its normally biased direction and out of locking engagement with said second mounting means to permit relative movement of said first and second furniture panels.

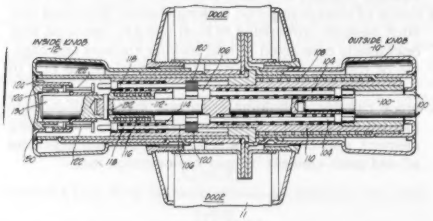


4. Locking apparatus according to claim 1, further comprising: locking means movable between locking and unlocking positions, wherein in said locking position, said locking means engages said first member to prevent movement thereof out of locking engagement with said second mounting means and in said unlocking position said locking means is disengaged from said first member to permit movement of the latter out of locking engagement with said second mounting member.

3,890,815
LOCK ASSEMBLY

James W. Raymond, 300 Avenida Cumbre, Newport Beach, Calif. 92660, and James A. Millett, 18143 Firestone Ct., Fountain Valley, Calif. 92708

Filed Feb. 19, 1974, Ser. No. 443,310
Int. Cl. E05b *27/08*
U.S. Cl. 70—363 **7 Claims**



1. A lock assembly including: a casing; a first tubular carrier mounted in said casing; a second tubular carrier mounted in said casing coaxially with said first carrier; a tubular logic carrier mounted in said casing at a first end thereof coaxially with said first and second tubular carriers; a first tubular logic member mounted coaxially in said tubular logic carrier and having axially extending quadrants of different lengths; a first plurality of pins mounted on said first carrier at angularly spaced positions around the axis thereof and individually axially movable in said first carrier; a first plurality of tumblers respectively mounted on the ends of said pins remote from said first tubular logic member and individually settable to different axial positions established by the lengths of the quadrants of said first logic member; a second plurality of pins mounted on said second tubular carrier at angularly spaced positions about the axis thereof displaced axially towards the other end of the casing and individually axially movable with respect to said second carrier; a second plurality of tumblers respectively mounted on the pins of the second plurality at the ends thereof adjacent the tumblers of the first plurality; and means for receiving a key in said other end of said casing to engage the pins of the second plurality and to set the tumblers of the second plurality at different axial positions to a predetermined relationship with respect to the positions of the tumblers of the first plurality to permit the second carrier to be turned relative to the first carrier.

3,890,816
ELIMINATION OF CARBIDE SEGREGATION TO PRIOR PARTICLE BOUNDARIES

Robert E. Allen, Cincinnati; Jon L. Bartos, Loveland, and Peter Aldred, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sept. 26, 1973, Ser. No. 400,920
Int. Cl. C22c *19/00*
U.S. Cl. 75—0.5 BA **5 Claims**

1. A nickel-base alloy powder, sized for use in making an article by powder metallurgical techniques, consisting essentially of:

0.03 to less than 0.3 wt. % C;
up to 16 wt. % total of elements selected from the group consisting of Al and Ti;
about 4–30 wt. % Cr;
up to about 3.6 at. % of elements selected from the group consisting of Mo and W;
at least one element selected from the group consisting of Cb, Ta, Hf and Zr, the Cb when selected being up to about 10 wt. %, the Ta when selected being up to about 10 wt. %, the Hf when selected being up to about 8 wt. %, and the Zr when selected being up to about 1 wt. %, the sum of selected elements being at least about 0.3 at. %;
up to about 5 wt. % V;
up to about 1 wt. % B;
up to about 30 wt. % Co;
with the balance essentially Ni and incidental impurities;
the alloy being characterized by the substantial absence of $M_{23}C_6$ carbide, the balance of the carbide being predominantly MC-type.

3,890,817
METHODS OF ROLLING STRIP MATERIALS, AND STRIP MATERIALS ROLLED THEREBY

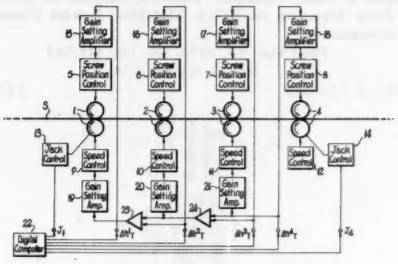
John Wilmot Beeston, Rugby; Greyham Frank Bryant, Southall, and Peter David Spooner, Pinner, all of England, assignors to Gec-Elliott Automation Limited, Hertfordshire, England

Filed Aug. 19, 1974, Ser. No. 498,549
Claims priority, application United Kingdom, Aug. 23, 1973, 40000/73
Int. Cl. B21b *37/00*
U.S. Cl. 72—6 **2 Claims**

1. A method of rolling strip material in a rolling mill having at least one adjustable rolling stand, comprises the steps of:

a. from measurements of the mill settings and data regarding the strip material to be rolled, calculating at least approximately the roll force to give the required gauge which should theoretically occur on the nose of the strip material at each stand, and also calculating theoretically the roll camber at each stand;
b. determining at least approximately the ideal roll force for each stand which, with the calculated roll camber on the respective stand, will give the nose a shape threadable into a subsequent rolling stand or a shape within predetermined limits of badness;
c. comparing the calculated roll force at each stand with the determined ideal roll force at that respective stand, and if the calculated roll force differs from the determined

ideal roll force sufficiently to give the nose an unthreadable shape or a shape outside predetermined limits of badness, modifying the mill settings to produce a roll force and/or a roll camber for each stand which will give the nose a threadable shape or a shape within predetermined limits of badness;



d. threading the strip material through the mill and as each inter-stand tension is successively established, changing the settings of the mill to those settings appropriate to a predetermined rolling schedule (if not already at those settings); and

e. rolling the strip material substantially according to the rolling schedule.

3,890,818

PROCESS FOR HOT EXTRUDING METALS

Jacques de Charsonville, L'Isle-Adam, France, assignor to Cefilac, Paris, France

Filed Mar. 14, 1973, Ser. No. 341,232
Int. Cl. B21c *23/32*
U.S. Cl. 72—42 **4 Claims**

1. In a process including heating and hot extruding billets of metals and alloys subject to surface contamination at their deformation temperature, the improvement comprising:

A. coating the billet surface, while cold, with a thin layer of powdered metal;

B. coating the coated surface of the billet, while cold, with a powdered amorphous material; and

C. forming a continuous protective layer on the billet surface by heating the coated billet to the temperature of hot extrusion, said layer protecting against surface contamination of the billets.

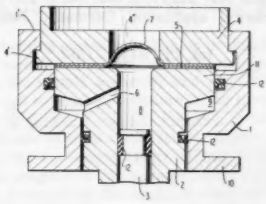
3,890,819

APPARATUS FOR DEFORMING SHEET METAL BLANKS BY FLUID PRESSURE

Bruno DeLuca, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed July 25, 1973, Ser. No. 382,506
Claims priority, application Italy, July 25, 1972, 51741/72
Int. Cl. B21d *26/04*
U.S. Cl. 72—57 **7 Claims**

1. Apparatus for deforming only a central portion of sheet material by fluid pressure, comprising means to clamp a peripheral portion of said material entirely about said central portion while leaving said central portion exposed, means mounting said clamping means for free and unimpeded movement toward said material, means to apply the pressure of a fluid under pressure to said exposed central portion of said material to deform only said central portion of said material, and means to apply said pressure also to said clamping means so that the force with which said peripheral portion is clamped by said clamping means varies directly as said pressure over the entire range of said pressure thereby to maintain said



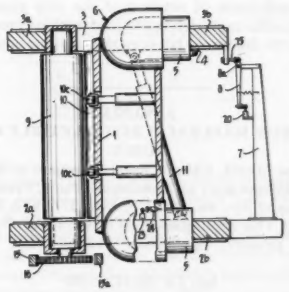
peripheral portion against substantial radially inward movement over said entire range of pressure.

3,890,820

PLATE BENDING MACHINES

Donald Hoggan; Ernest Walter Wright, and Ian Day, all of West Footscray, Australia, assignors to Industrial Engineering Limited, Australia

Filed Oct. 15, 1973, Ser. No. 406,614
Int. Cl. B21d *5/14*
U.S. Cl. 72—169 **4 Claims**



1. A plate bending machine comprising:

a bi-partite frame of open rectangular construction;

a roll member rotatably mounted at each end in said frame; two hydraulic piston-cylinder members mounted relative to said frame;

a movable bolster associated with the piston-cylinder members and slidably mounted on said frame for reciprocal movement relative to said roll member in response to applied fluid pressure in said piston-cylinder members, the longitudinal axis of the frame being substantially in alignment with respective axes of the hydraulic piston-cylinder members;

abutment members extending from said bolster and toward said roll member for contacting, holding and bending a plate to be bent to conform the plate to the periphery of the roll member, one of the piston and cylinders of each of said members forming a rigid joint with the movable bolster and forming a rigid structure with the roll member and the bipartite frame.

3,890,821

COLD PILGER ROLLING MILL AND METHOD FOR THE ROLLING OF TUBES

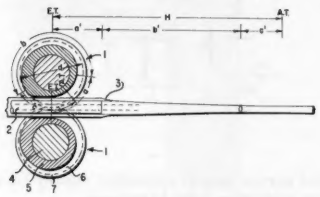
Josef Gerretz, Viersen, and Fritz Zeunert, Rheydt, both of Germany, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed May 22, 1974, Ser. No. 472,250

Claims priority, application Germany, June 7, 1973, 2329526

Int. Cl.[2] B21B *21/00*

U.S. Cl. 72—208 **3 Claims**



1. Cold pilger rolling mill for the rolling of tubes, having a reciprocating stand and grooved rolls mounted therein, and a device for advancing and/or turning the rolled material, and having a torque and mass compensation arrangement, the grooved rolls being in working contact with the rolled material at the outgoing travel and at the return travel and releasing the rolled material for advancing and/or for turning before the outgoing travel and before the return travel, characterized in that the grooved rolls are ring grooved rolls in which a portion of their circumferences comprises cooperative tapered working groove portions, and said mill includes means for causing a rotation angle of said ring grooved rolls during each of an outgoing and return travel to be greater than 330°, and wherein each angle of rotation of the ring grooved roll is smaller than the angle defined by said working groove portion plus twice the difference between this working groove portion and 360°.

3,890,822

PUNCH FOR MANUFACTURING FLEXIBLE CONICAL TUBES

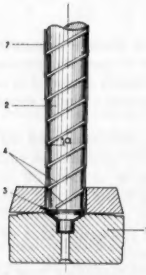
Phlippoteau Michel, S'Maur, France, assignor to Scal (Societe de Conditionnement en Aluminum), Paris, France

Division of Ser. No. 309,773, Nov. 27, 1972, Pat. No. 3,839,890. This application June 6, 1974, Ser. No. 476,868

Claims priority, application France, Nov. 25, 1971, 71.42251

Int. Cl.[2] B21C *25/00*

U.S. Cl. 72—273 **6 Claims**



1. A punch for manufacturing flexible metal tubes of frusto-conical shape from a metal blank by inverse-impact extrusion in which the punch has axially spaced helical projecting ridges over at least a portion of its length and in which the cross section of each ridge is generally in the shape of a trapezium having a base which tapers outwardly gradually from the direction of the head of the punch to a frustum the axis of which coincides with the axis of the punch.

3,890,823

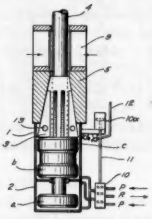
METHOD AND A DEVICE FOR REDUCING THE PIPE DIAMETER

Stefan I. Radu, Constanta, Romania, assignor to Intreprinderea Mecanica de Utilaje Medcidia, Judetul Constanta, Romania

Filed Mar. 15, 1973, Ser. No. 341,743

Int. Cl. B21d *41/04*

U.S. Cl. 72—402 **3 Claims**



1. An apparatus for shaping a workpiece comprising:

an upright support;

a vise having radially movable clamps engageable with said workpiece in an upright position thereof for centering said workpiece on said support, said vise being vertically movable with said workpiece;

a sleeve fixed on said support and surrounding said workpiece below said vise, said sleeve having an upwardly tapering cavity;

an annular array of shaping jaws vertically shiftable on said support and receivable in said cavity, said jaws having conical segment, outer faces engageable with the wall of said cavity and stepped inner faces conforming to the configuration to be shaped in said workpiece;

a support plate carrying said array of jaws and vertically displaceable therewith;

at least one hydraulic motor mounted on said support for shifting said plate upwardly to drive said jaws into said cavity and displace said jaws vertically and radially to deform said workpiece; and

control means for selectively pressurizing said hydraulic motor with a hydraulic medium.

3,890,824

IMPLOSION JACK

Jean Camion, demeurant 43, carnot, Nogent; Etienne Campot, demeurant 6, avenue de brimont, Chatou; Jean Conneau, demeurant 58 Bd. Voltaire, Paris; Serge Contival, 253 Bd. Gabirel Peri, Noisy-Le-Sec; Andre Dejoux, demeurant 15, rue Lakanal; Jean Detton, demeurant 80 rue Taitbout, both of Paris; Maurice Gournelle, demeurant 1 rue des Bruyeres, Asnieres, and Antoine Traimond, 7 rue Jean Ferrandi, Paris, all of France

Filed Nov. 2, 1972, Ser. No. 303,057

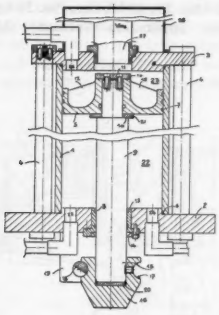
Claims priority, application France, Nov. 5, 1971, 71.39699

Int. Cl. B21j *7/20*

U.S. Cl. 72—453 **14 Claims**

1. A force-producing device comprising a chamber, a piston movable between first and second positions in the chamber, transmitting means connected to the piston for transmitting force generated by the piston moving between the first and second positions, vacuum means connected to the chamber on both sides of the piston for evacuating fluid from the chamber, fluid means connected to the chamber on both sides of the

piston for introducing fluid into the chamber, valve means associated with the vacuum and fluid means for selectively



communicating the vacuum and fluid means with the chamber on each side of the piston.

3,890,825

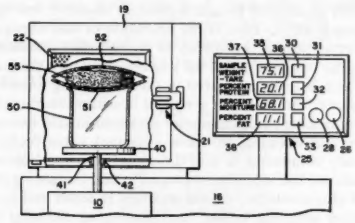
ANALYSIS OF COMMINUTED MEAT PRODUCTS

Kenneth E. Davis, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Continuation-in-part of Ser. No. 268,926, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 29,278, April 16, 1970, Pat. No. 3,673,852. This application Oct. 18, 1973, Ser. No. 407,667

Int. Cl. G01n *25/02*

U.S. Cl. 73—15 B **20 Claims**



1. A process for the determination of fat content of edible comminuted meat products comprising the steps of

a. providing a sample of known weight, the weight of said sample being the same or variable for each determination of fat content,

b. exposing said sample to dielectric heating for a period of time sufficient to render the fat and moisture and to provide a residue cooked short of charring, said dielectric heating being operative to effect release of said moisture directly as vapor and said fat being released as liquid,

c. collecting the melted fat rendered from said sample,

d. weighing said melted fat,

e. determining from the weight of melted fat alone the amount of fat remaining in the residue and the loss of fat with moisture, said determined amount being variable depending upon the amount of fat rendered from the sample, and

f. calculating the amount of fat in the sample from the rendered amount and said determined amount.

11. Apparatus for determining the amount of moisture and/or fat and/or protein in a comminuted meat product comprising

a sample holder assembly for holding a sample of the product to be analyzed,

said sample holder assembly including a receptacle means operable to collect separately fat released from the sample,

dielectric heating means including an enclosure for receiving said sample holder assembly and a sample thereon for heating the sample to render and collect fat from the sample and to vaporize moisture in the sample,

scale means having a support member in said enclosure proportioned to receive said sample holder assembly for determining the weight of the sample both before and after the weight loss due to vaporization of moisture and also for determining the weight of rendered fat collected in said sample assembly,

said scale means providing output signals related to each of such weights, and

computing means connected to receive said signals from said scale means and to compute the percentage of moisture in the original sample as a function of the weight of moisture vaporized and released from the sample.

3,890,826

INTOXICATED DRIVER CAPABILITY TESTER

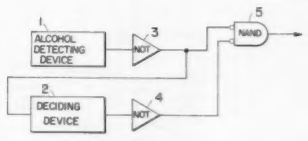
Fumiyuki Inose; Takaji Suzuki, both of Kokubunji, and Hideki Kohno, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1973, Ser. No. 341,844

Claims priority, application Japan, Mar. 17, 1972, 47-27863

Int. Cl. G01n *31/00*

U.S. Cl. 73—27 R **8 Claims**



1. An intoxicated driver capability tester comprising:

means for detecting alcohol in a driver's body which generates a first output signal when the amount of alcohol in the driver's body is less than a predetermined reference value and which generates a second output signal when the amount of alcohol in the driver's body is greater than the predetermined reference value;

first signal generating means for generating a third output signal when the first output signal is applied from said alcohol detecting means and for generating a fourth output signal when the second output signal is applied from said alcohol detecting means;

means for deciding a driver's capability for driving, said deciding means being responsive to the fourth output signal from said first signal generating means for initiating an operation to be effected by the driver to determine the driver's capability for driving, said deciding means being responsive to the operation effected by the driver for generating a fifth output signal when the driver is in a state capable of driving and for generating a sixth output signal when the driver is not in a state capable of driving;

second signal generating means for generating a seventh output signal when the fifth output signal is applied from said deciding means and for generating an eighth output signal when the sixth output signal is applied from said deciding means; and

third signal generating means having one input for receiving the output signals from said first signal generating means and another input for receiving the output signals from

said second signal generating means, said third signal generating means generating a ninth output signal indicative of a state capable of driving in response to said third output signal being applied to the one input thereof, generating a tenth output signal indicative of a state capable of driving in response to said seventh output signal being applied to the another input thereof, and generating an eleventh output signal indicative of a state not capable of driving in response to the fourth output signal being applied to the one input thereof and the eighth output signal being applied to the another input thereof.

3,890,827

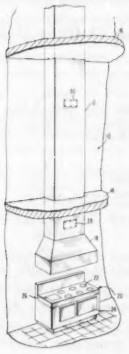
METHOD AND APPARATUS FOR MONITORING GREASE BUILDUP WITHIN AN EXHAUST SYSTEM

Quentin H. Van Schoyck, Christmas, Fla., assignor to Cylpik, Incorporated, Winter Park, Fla.

Filed Aug. 23, 1973, Ser. No. 390,757

Int. Cl. G01n *33/00*

U.S. Cl. 73—28 **10 Claims**



1. A method for monitoring the collection and buildup of grease upon the interior surface of an exhaust system of the type utilized to vent vapors from a cooking facility comprising the steps of:

a. applying at least one set of operably connected patches upon the interior surface of the exhaust system;

b. removing one of the patches from the set of patches at a predetermined time subsequent to initial application of the set of patches;

c. examining the removed patch to determine the quantity of grease collection upon the patch;

d. comparing the quantity of grease collected upon the removed patch with a preselected standard to determine the quantity of grease buildup within the exhaust system; and

e. repeating steps (*b*) through (*d*) until the set of patches are exhausted or the preselected standard of grease buildup is exceeded.

3,890,828

DEVICE FOR MEASURING THE HUMIDITY OF GASEOUS SUBSTANCES

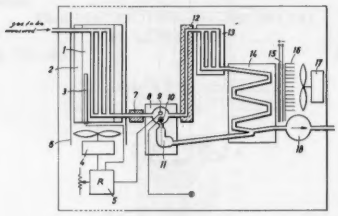
Harry Pleva, Rutesheim, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed May 29, 1973, Ser. No. 364,612

Claims priority, application Germany, May 30, 1972, 7225853

Int. Cl. G01n *25/62*

U.S. Cl. 73—29 **7 Claims**



1. A device for measuring the humidity of gaseous substances in conformity with the psychrometric method, which includes: heat exchanger means for heat exchange with a gaseous substance the humidity of which is to be measured, a measuring chamber arranged in series with said heat exchanger means for receiving from the latter the gaseous substance the temperature of which is to be measured, first conduit means for conveying gaseous substance the humidity of which is to be measured to said heat exchanger means, second conduit means leading from said heat exchanger means to said measuring chamber for conveying gaseous substance after its heat exchange with said heat exchanger means to said measuring chamber, a cooling blower and electric heating means associated with said heat exchanger means for respectively cooling and heating up the gaseous substance passing through said heat exchanger means, and thermostatic control means operatively connected to said measuring chamber and operable automatically to control the operation of said blower and said electric heating means so as to maintain substantially constant the temperature of the gaseous substance the humidity of which is to be measured in said measuring chamber, a dry resistance thermometer arranged in said measuring chamber, a dry resistance thermometer arranged in said measuring chamber and operable to serve as actual value feeler and operatively connected to said thermostatic control means, a wet resistance thermometer arranged in said measuring chamber, and also condenser means arranged in series and in communication with but behind said measuring chamber when looking in the direction of flow of the gaseous substance passing from said measuring chamber to said condenser means, said condenser means having an outlet, said wet resistance thermometer arranged in said measuring chamber having an aspiration element, and third conduit means having one end connected to said outlet and having its other end connected to said aspiration element, said other end of said third conduit means being located at a lower level than said outlet.

3,890,829

METHOD AND APPARATUS FOR ACOUSTICAL IMAGING

Adrianus Korpel, Prospect Heights, and Robert L. Whitman, Oak Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

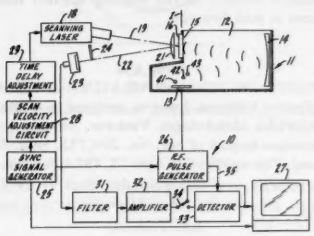
Filed Apr. 11, 1973, Ser. No. 350,276

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.5 H **8 Claims**

1. The method of acoustically inspecting a specimen in a sonic propagation medium comprising the following steps:

pulse-insonifying the specimen with a series of periodically repetitive pulses of high-frequency acoustic energy propagated along a given insonification path so as to generate reflected acoustic waves in the sonic medium from points on the specimen lying in a predeterminable object plane, the direction of the insonification path being chosen such that the angle formed between the insonification path and the normal to the object plane is substantially greater than zero, and the duration of each acoustic pulse being very much shorter than the pulse repetition period;



receiving the reflected waves at an image plane having a predetermined angular displacement other than normal from the insonification path;

scanning the image plane with a transducer to intercept acoustic energy from the specimen and develop an electrical signal characteristic of the acoustic properties of the specimen along a desired object plane intersecting the specimen; and

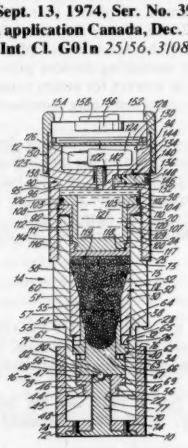
synchronizing the velocity and location of the scanning with energy arriving at successive points in the image plane from points successively insonified by an acoustic pulse in the object plane.

3,890,830

GRAIN MOISTURE TESTER

Gerhard J. Dyck, 1306 13th St. E., Saskatoon, Canada

Filed Sept. 13, 1974, Ser. No. 396,750
Claims priority, application Canada, Dec. 13, 1972, 158724
Int. Cl. G01n *25/56, 3/08*
U.S. Cl. 73—73 **2 Claims**



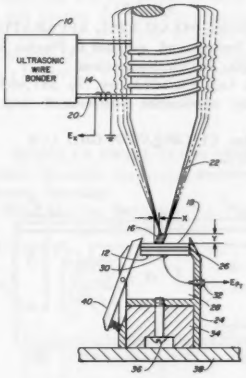
1. An apparatus for determining the moisture content of particulate material by compressing said particulate material said apparatus comprising: (a) a substantially closed variable volume compression chamber; (b) a hollow piston slidable in said chamber, the interior of said piston including a substantially concave face and comprising a plurality of telescopically interengageable hollow piston elements relatively movable with respect to one another, whereby the interior of said hollow piston provides a generally frusto-conical compression chamber, and whereby the volume of said generally frusto-conical chamber may be varied; (c) a plug disposed movably therein to provide a wall of said generally frusto-conical chamber facing said concave piston face and movable towards and away from said concave piston face; (d) piston actuating means for moving said piston elements relative to one another, thereby to vary the volume of said generally frusto-conical chamber, said piston actuating means comprising means for sequentially moving said piston elements relative to one another; and (e) a transducer means operatively associated with said plug to resist movement of said plug in response to a pressure generated within said compression chamber, and to provide a signal indicative of a pressure generated within said compression chamber, said signal being indicative of the moisture content of said particulate material.

3,890,831

ULTRASONIC BOND MONITOR

John H. Cusick, Santa Rosa; Alvin E. Brown, Redwood City; Al S. Hamamoto, San Jose, and Jack L. S. Bellin, Palo Alto, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 325,272, Jan. 19, 1973. This application Feb. 22, 1974, Ser. No. 444,927
Int. Cl. G01n *19/04*
U.S. Cl. 73—88 B **2 Claims**



1. A method of indicating the quality of a bond made by an ultrasonic bonder during the bonding process comprising:

deriving a first electrical signal proportional to the tangential forces applied to the materials during the bonding process;

deriving a second electrical signal proportional to the traverse motion of the bonding tool;

combining the first and second electrical signals to produce an output signal equal to the ratio of the first electrical signal to the second electrical signal; and

displaying the combined signal so that the operator of the ultrasonic bonder can readily detect poor bonds.

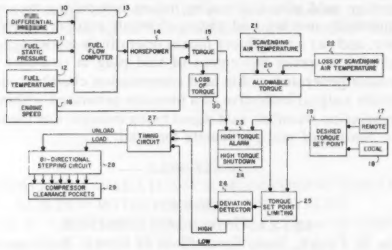
3,890,832
ENGINE TORQUE MONITORING SYSTEM

Charles F. Nick, and Morris J. Davidson, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 164,555, July 21, 1971, Pat. No. 3,808,882. This application Feb. 14, 1974, Ser. No. 442,566

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—116 **7 Claims**



1. A system for monitoring the torque on an engine, comprising:

means for generating a first electrical signal functionally related to such torque;

means for generating a second electrical signal indicative of a desired torque set point;

means for comparing said first and said second electrical signals to establish the deviation therebetween; and

means for generating a third electrical signal functionally related to a performance characteristic of the engine and means for limiting said second electrical signal with said third electrical signal.

3,890,833
PRESSURE MEASURING APPARATUS

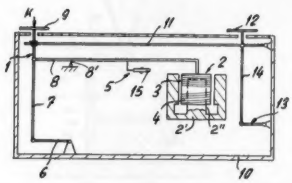
Jon Peer, Stafa, Switzerland, assignor to Precisa AG, Rechenmaschinenfabrik, Zurich, Switzerland

Filed Aug. 13, 1973, Ser. No. 387,663

Claims priority, application Switzerland, Aug. 18, 1972, 12249/72

Int. Cl. G01g *7/02*; **G01l** *1/14*

U.S. Cl. 73—141 A **8 Claims**



1. Measuring apparatus comprising:

a force sensing unit mounted for movement in response to a force to be measured and having a rest position from which it is displaced to an extent dependent upon the magnitude of said force;

a magnetic structure comprising a permanent magnet component including a core portion and a composite coil component comprising first and second separately energizable coils mounted on said core portion for displacement relative thereto, one of said components being stationary and the other component being movable and interconnected with said force sensing unit for balancing a force applied thereto;

means for sensing an initial displacement of said force sensing unit from its rest position and providing a corresponding output current in said first coil which produces a corresponding counter balancing electromagnetic force that restores said force sensing unit to its rest position; and

means for sensing the current in said first coil and maintaining an output current in said second coil to hold said force sensing unit in its rest position, the force applied to said force sensing unit being now balanced by the electromagnetic force produced by said second coil so that the current in said first coil drops to zero, whereby subsequent forces applied to said force sensing unit are balanced by an electromagnetic force produced by said first coil and measured relative to the initially applied force by the current in said first coil.

3,890,834
FORCE OR TENSION MEASURING MEANS

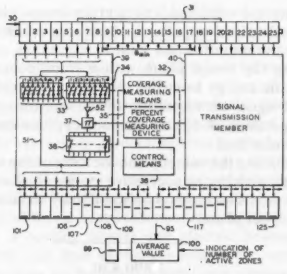
Michael Henze, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Continuation-in-part of Ser. No. 394,773, Sept. 6, 1973, abandoned. This application Apr. 17, 1974, Ser. No. 461,730

Claims priority, application Sweden, Sept. 11, 1972, 11654/72

Int. Cl. G01l *5/10*

U.S. Cl. 73—144 **6 Claims**



1. In an arrangement wherein a plurality of measuring devices are arranged side-by-side for measuring the pressure of a strip placed on top thereof at each a plurality of zones, with the outputs of the measuring devices provided to indicating means, apparatus to correct for errors caused by the measuring devices on the ends not being completely covered by the strip comprising:

a. means for coupling the measuring devices of the completely covered zones to the indicating means;

b. means having the outputs of said partially covered devices as inputs, said means adapted to correct said inputs and provide corrected outputs; and

c. means providing said corrected outputs to said indicating means.

3,890,835
CHEMICAL RECORDING OF FLOW PATTERNS

Richard Dötzer, and Winfried Plundrich, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 7, 1972, Ser. No. 269,746

Claims priority, application Germany, July 7, 1971, 2133835

Int. Cl. G01m *9/00*

U.S. Cl. 73—147 **12 Claims**

1. A method of chemically recording the flow pattern of a fluid over a surface which comprises:

treating said surface to produce an oxidized layer of aluminum upon said surface,

passing over said layer a fluid containing a reagent compound which produces a chemical change upon contact

with said layer which is characteristic of the flow pattern of the fluid over the layer, and

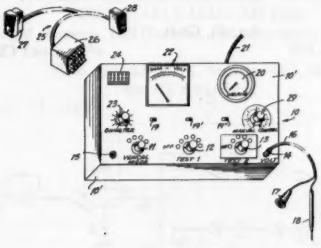
visibly recording said flow pattern with a dye substance in said layer.

3,890,836

AUTOMATIC TEMPERATURE CONTROL SYSTEM ANALYZER

James M. McKenzie, Tarrytown, and Jeffrey L. Sachs, Harrison, both of N.Y., assignors to Draf Tool Co., Inc., Bedford Hills, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,448
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—168 8 Claims



1. An analyzer for testing a plurality of automatic temperature control systems comprising in combination:

meter means for measurement of a voltage applied thereto;

harness interposition means adapted to interpose said analyzer into the electric harness system of an automobile's automatic temperature control system at a plurality of connection points;

model selector switching means electrically coupled to the connection points of said harness interposition means for selecting an operative mode of said analyzer corresponding to the type of automatic temperature control system to be tested by providing connection to the active connection points associated with said type of system;

meter adapter means including said meter and a plurality of terminals for selectively coupling said meter means to selected terminals dependent upon the type of system to be tested;

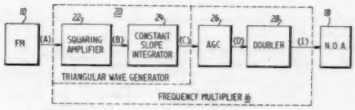
test selector and adapter means electrically coupled to said mode selector means and meter adapter means for interconnecting selected connection points through said mode selector switching means and meter adapter means terminals for selectively modifying or channeling the signals therebetween for the performance of at least two tests on each type of system, and a rectifier having input terminals coupled to said mode selector means and output terminals coupled to said test selector and adapter means.

3,890,837

ELECTRONIC SIGNAL MULTIPLIER FOR FLOWMETERS

Joseph G. Frizzell, and Jack R. Hulme, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 286,429, Sept. 5, 1972, Pat. No. 3,796,960. This application Oct. 29, 1973, Ser. No. 410,398
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 E 9 Claims



1. Apparatus for multiplying the frequency of the output signal from a fluid flowmeter means in which the frequency is variable as a function of fluid flow through the flowmeter means, comprising:

means for generating a square wave signal corresponding in frequency to the frequency of said flowmeter means output signal;

means for integrating said square wave signal for providing a triangular wave signal related in both peak-to-peak amplitude and frequency to the frequency of said output signal;

means for adjusting the peak-to-peak amplitude of said triangular wave signal to a predetermined constant value while leaving the frequency thereof unchanged; and

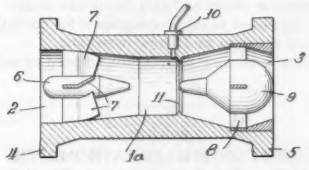
doubling means including means for simultaneously full wave rectifying said amplitude adjusted triangular wave signal and biasing the full wave rectified signal by an amount sufficient to center it about a zero reference potential axis, thereby to provide a triangular wave signal having a frequency double that of said output signal.

3,890,838

TUBULAR SWIRL FLOW METER

Wolf Paetzold, Hocheim, Germany, assignor to Elster AG, Mainz-Kastel, Germany

Filed May 16, 1974, Ser. No. 470,404
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 B 5 Claims



1. In a tubular swirl flow meter having a measuring tube, a swirl device at the entrance thereto and a measuring sensor downstream from the swirl device, the improvement wherein an annular shoulder is provided in the measuring tube near the sensor, the height of said shoulder being approximately equal to the normal thickness of the boundary layer for the flowing fluid having the smallest Reynolds number.

3,890,839

APPARATUS FOR MEASURING A FLUID FLOW RATE

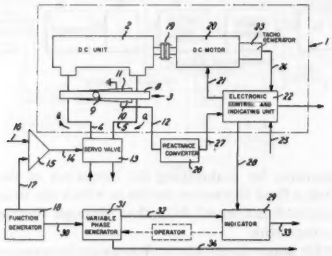
Erik Trostmann, Birkerod, and Jens Andreas Toft Fensvig, Lyngby, both of Denmark, assignors to Instituttet for Produktudvikling, Lyngby, Denmark

Filed July 20, 1973, Ser. No. 381,138

Claims priority, application Denmark, July 25, 1972, 3676/72

Int. Cl. G01f *1/00*

U.S. Cl. 73—199 **14 Claims**



1. An apparatus for measuring a fluid flow rate, said apparatus comprising:

a. a positive displacement screw rotor device having a stator with a fluid inlet and a fluid outlet, a displacer screw rotor rotatably supported in said stator, and a variable speed drive motor for said rotor;

b. a cylinder made of an electrically insulating material connected between said fluid inlet and said fluid outlet in parallel with said positive displacement screw rotor device;

c. a piston-like body at least the surface of which is made of an electrically conductive material, said piston-like body being freely movable within said cylinder in the longitudinal direction thereof substantially without viscous friction between said piston-like body and the internal wall of said cylinder;

d. two capacitor plates which are insulated from one another and from said piston-like body, said capacitor plates extending in the longitudinal direction of said cylinder substantially diametrically opposite each other with a distance between them which decreases from one end of said cylinder towards the opposite end thereof;

e. a converter for supplying an electric output signal dependent upon the capacitance of the capacitor formed by said capacitor plates and said piston-like body;

f. means responsive to said output signal for controlling the rotational speed of said screw rotor; and

g. means for indicating the rotational speed of said screw rotor.

3,890,840

LASER CONTROLLED FATHOMETER

Richard J. Malloy, Ojai, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 7, 1974, Ser. No. 477,250

Int. Cl. G01b *11/26;* **G01f** *23/00*

U.S. Cl. 73—290 V **7 Claims**

1. A laser controlled fathometer comprising:

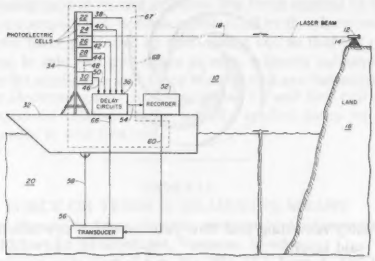
a. means placed on a datum point for generating a laser beam in a horizontal plane;

b. a depth sounding transducer for transmitting and receiving a sonar signal;

c. means for supporting said transducer a fixed distance under the surface of a body of water;

d. a recorder communicating with said transducer; and

e. detector means affixed to said transducer support means and communicating with said recorder for receiving said laser beam at one of a plurality of laser beam receptor



cells thereon indicative of the position of said detector means with respect to said datum point and for delaying the recording of a received signal from said transducer for a specific time.

3,890,841

THERMAL NOISE MEASUREMENT SYSTEM

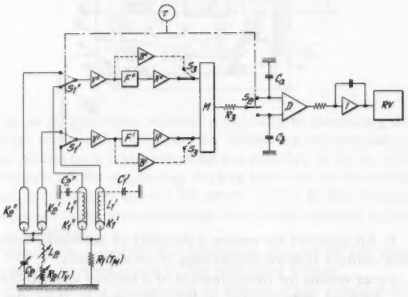
Heinz Brixy, Julich, Germany, assignor to Kernforschungsanlage Julich GmbH, Julich, Germany

Filed June 13, 1973, Ser. No. 369,733

Claims priority, application Germany, June 15, 1972, 22291403

Int. Cl. G01k *7/30*

U.S. Cl. 73—359 **7 Claims**



1. A system for the measurement of temperature, comprising:

a measuring branch having a measuring resistor adapted to generate a thermal-noise signal proportional to absolute measure temperature and at least one cable in series with said measuring resistor;

a reference branch including a reference resistor at a reference temperature and at least one cable in series therewith;

a pair of amplifier paths each comprising a preamplifier, a filter connected to the output of the respective preamplifier, and a main amplifier energized through the respective filter;

switch means for alternately connecting said branches to said amplifier paths so that both amplifier paths are simultaneously connected in one switch condition with one branch and in another switch condition with the other branch;

a multiplier circuit receiving inputs from the main amplifier of both said amplifier paths for producing an output representing the product of the signals applied thereto;

a differential amplifier having a pair of inputs each connected to a respective storage capacitor;

a commutating switch synchronized with said switch means for applying the output of said multiplier corresponding to connection of one of said branches to both said amplifier paths to one of said capacitors in one such condition and the output of said multiplier corresponding to connection of the other of said branches to both said amplifier paths to the other capacitor in said other switch condition;

an integrator receiving an output from said differential amplifier; and

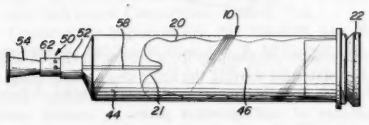
read out means connected to said integrator for registering the temperature at said measuring resistor, said switch means including two single-pole double-throw switches having respective output contacts connected to the preamplifier of each of said amplifier paths, said measuring branch comprising a first cable connected to one input contact of one of said single-pole double-throw switches and a second cable connected to the corresponding input of the other single-pole double-throw switches, said reference branch having a first cable connected to the other input contact of said one of said single-pole double-throw switches and a second cable connected to the other input contact of the other single-pole double-throw switch, said single-pole double-throw switches being ganged for joint operation.

3,890,842

DISPOSABLE MANOMETER

Maynard Ramsey, III, Durham, N.C., assignor to Ramtech, Inc., Tampa, Fla.

Filed Apr. 23, 1974, Ser. No. 463,393
Int. Cl. G01l *7/00*
U.S. Cl. 73—420 **10 Claims**



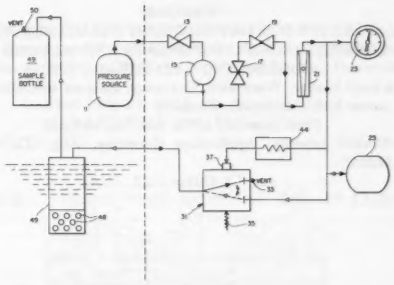
1. A disposable blood pressure monitor comprising an elongated tubular structure, means on one end of said tubular structure adapted to place the interior of said tubular structure in direct communication with a fluid system to be monitored, a flexible membrane received within said tubular structure, said flexible membrane separating said tubular structure into first and second chambers, stopper means engaging the other end of said tubular structure and filling means removably mounted on said means of said tubular structure adapted to place the interior of said tubular structure in direct communication with a fluid system to be monitored, said filling means comprising a hollow receptacle member, tube means secured to said hollow receptacle member and communicating with said hollow receptacle member, said tube means extending into said tubular structure and engaging said flexible membrane to depress said flexible sac-like membrane within said tubular structure.

3,890,843

LIQUID SAMPLING

Malcolm F. Irwin, West Chester, Pa., assignor to Pro-Tech Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 341,319, March 14, 1973, Pat. No. 3,788,145. This application Jan. 28, 1974, Ser. No. 437,530The portion of the term of this patent subsequent to Jan. 29, 1990, has been disclaimed.
Int. Cl. G01n *1/14*
U.S. Cl. 73—421 B **5 Claims**



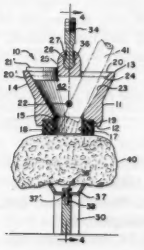
1. In apparatus for sampling liquid from a body thereof, including means for accumulating propellant fluid at a given rate from a source thereof under superatmospheric pressure and normally closed switching valve means between the accumulating means and a sampling locus in the body of liquid, the valve means having a pressure-sensing line connected to the accumulating means and being adapted to open at a given actuating pressure and to reclose at a given decrement in pressure sensed thereby, improved fluid-impeding means located in the pressure-sensing line, being effective to reduce the rate of pressure drop therein upon actuation and thus to increase the open time of the valve means for a given pressure decrement and comprising a fluidic delay line.

3,890,844

PERIPHYTON SAMPLER AND METHOD FOR SAMPLING

William F. Gale, River Rd., Wapwallopen, Pa. 18660

Filed July 25, 1974, Ser. No. 491,694
Int. Cl. G01h *1/02*
U.S. Cl. 73—421 R **8 Claims**



1. A periphyton sampler for underwater use by SCUBA divers on stones and other solid underwater objects to collect periphytic cells and the like from the solid object being sampled comprising a rigid hollow body member having a top, a bottom and an integral connecting side wall, an aperture through said bottom defined by a circular margin, a rigid cylindrical collar having one end extending outwardly from said bottom and its other end affixed to the bottom inside said margin, a pliable sealing collar surrounding said rigid collar frictionally retained thereon, said sealing collar having one

end extending outwardly beyond said one end of said rigid collar in order to sealingly engage with the surface of a solid object having surface irregularities thereon, at least one opening in said top to permit the access of a cleaning implement inside of said hollow body to aid in removing periphytic cells from said stone, a stopper for closing said top opening, a conduit extending through said side wall for draining a sample from the hollow body, and means for clamping said hollow body to a solid object with said sealing collar engaged in sealing relationship to the surface of said solid object.

3,890,845
APPARATUS FOR DETERMINING IMBALANCE IN 120 DEGREE SPACED COMPONENTS AND METHOD OF CORRECTING SAID IMBALANCE

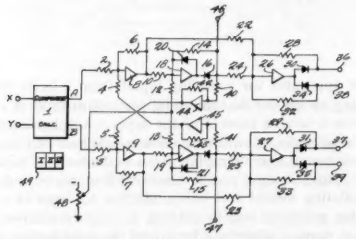
Richard Muller, Worfelden, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Filed June 26, 1974, Ser. No. 483,442

Claims priority, application Germany, Aug. 23, 1973, 2342665

Int. Cl. G01m *1/22, 1/34*

U.S. Cl. 73—462 **6 Claims**



1. In a method of eliminating imbalances in rotors, with which a compensation of masses by removing material is carried out in components displaced by 120°, and with which further material is subsequently removed in components displaced by 60° with respect to the former components, in case only limited material is available for removal, the improvement wherein, if the amount of initial imbalance in a first component exceeds the amount of material available for removal in this component, the removal of the maximum possible amount of material is effected leaving a residual amount still to be eliminated in this component, and material is removed in a second adjacent component displaced by 120° until in this component, too, an amount of imbalance has been obtained equal to said residual amount, and that the imbalance resulting from these two residual amounts is eliminated by removing material in a third component displaced by 60° with respect to both said first and second components.

3,890,846
UHF TUNER COMPOSITE DIAL MOUNTING ARRANGEMENT

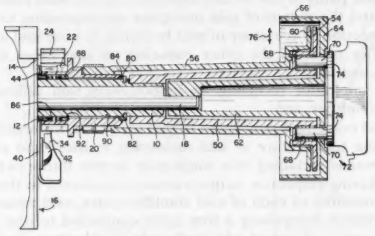
Alarico A. Vaidettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed May 24, 1973, Ser. No. 363,589

Int. Cl. F16h *35/18;* **H03j** *1/14*

U.S. Cl. 74—10.41 **5 Claims**

1. In a UHF tuner of the type having a continuously variable main tuning shaft rotation of which is effective selectively to receive signals from all television stations in the UHF band, a selector shaft, a sleeve-like member generally concentric with and surrounding said selector shaft, and means for rotating said sleeve-like member a predetermined increment for each revolution of said selector shaft, the improvement comprising means for mounting said sleeve-like member so that it may be rotated by said predetermined increments without tilting of the longitudinal axis thereof with respect to said selector shaft, said mounting means including means defining an annular bearing seat on said selector shaft having an annular sloping bearing surface, and means urging said sleeve-like member



into engagement with said bearing surface, thereby to maintain said sleeve-like member centered relative to said selector shaft as said member is rotated by said predetermined increments.

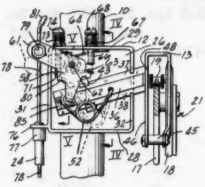
3,890,847
FRONT DERAILLER FOR BICYCLES

Walter Dian, Downers Grove, Ill., assignor to Beatrice Foods Company, Elgin, Ill.

Filed Apr. 12, 1974, Ser. No. 460,542

Int. Cl. F16h *11/04;* **B62m** *9/00, 1/02*

U.S. Cl. 74—217 B **8 Claims**



1. A front derailler mechanism for a bicycle having at least two sprocket plates for moving the drive chain comprising, a displaceable fork engageable with said chain to change it from one to another of said sprocket plates, a control cable mounted on the bicycle and movable to at least two positions, a control unit mounted on the bicycle and connected to said control cable and to said displaceable fork and including means for moving said fork between said sprocket plates under control of said control cable wherein under conditions when said fork is blocked from moving the fork will not move when said control cable is moved but will be subjected to a spring bias so that it moves to the commanded position when blocking has terminated and such that the cable is not subjected to excessive tension forces.

3,890,848
CONTROL ASSEMBLY FOR REAR VIEW MIRROR

James G. Clontz, 108 S. Gum St., Summerville, S.C. 29483

Filed May 13, 1974, Ser. No. 469,479

Int. Cl. F16c *1/10*

U.S. Cl. 74—501 M **2 Claims**

1. A rear view mirror mounted externally of a vehicle operable by the driver's foot adjacent the floorboard interiorly of the vehicle for observing the position of a passing motorist comprising:

a substantially vertical standard carried externally of the vehicle supporting the mirror in an adjusted position;

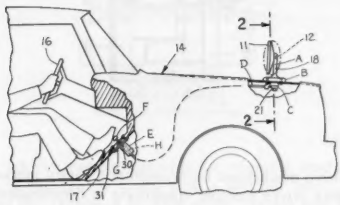
means for mounting said standard on said vehicle for oscillatory movement about a fixed substantially vertical axis externally of the vehicle;

linkage means carried by said standard extending laterally thereof;

a flexible cable connected on one end to said linkage means for moving said linkage means imparting oscillatory movement to said standard;

an elongated housing carried by said vehicle adjacent the floorboard for receiving the other end of said cable;

a pedal carried interiorly of said vehicle adjacent the floorboard depressible by the driver's foot;



an operator extending from said pedal into said housing engaging said other end of said cable within said housing for movement responsive to movement of the pedal; and resilient means within said housing, exerting a resilient force urging said operator in a direction against movement by the pedal;

whereby the mirror may be moved from said adjusted position to a position for observing a passing motorist by depression of the pedal by the driver's foot, and whereby the mirror will return to said adjusted position automatically responsive to said resilient means upon release of the pedal by the driver's foot.

3,890,849

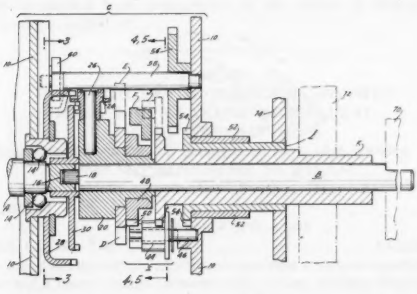
UHF TUNER STOP MECHANISM

Meigs Newberry, East Longmeadow, Mass., assignor to General Instrument Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 386,839, Aug. 8, 1973, abandoned. This application Jan. 9, 1974, Ser. No. 432,048

Int. Cl. F16h *35/18*

U.S. Cl. 74—10.2 **29 Claims**



1. A stop assembly for use with a tuning mechanism in a TV receiver or the like comprising a support, a coarse tuning shaft rotatably mounted on said support and operably connected to condition the tuner mechanism, a rotatable member operably connected to said shaft to be driven thereby and having a cam thereon with a raised section and a lowered section, a pawl movable by said cam between an inner position wherein it engages said lowered section of said cam and an outer position wherein it engages said raised section of said cam, a stop lug rotatably mounted on said support and operably connected to said disc to be rotated thereby, said lug having an extended portion located radially outwardly from said pawl when the latter is in said inner position, normally out of the path of movement of said pawl toward its said outer position but movable to intersect the said path of movement of said pawl and prevent said pawl from moving to its outer position at a predetermined point in the rotation of said disc.

3,890,850

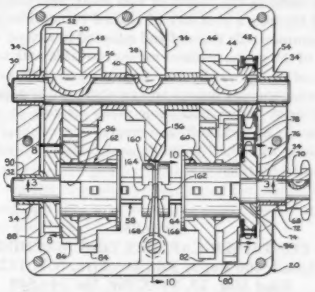
TRANSMISSION WITH DRAW-KEY TYPE SHIFT

Hans Hauser, and Robert D. McGuire, both of Fredericktown, Ohio, assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed May 21, 1973, Ser. No. 362,116

Int. Cl. F16h *3/08*; **F16d** *21/04*

U.S. Cl. 74—372 **23 Claims**



1. A transmission comprising a rotatably-mounted shaft having longitudinally-extending guide means, a plurality of toothed members rotatably mounted on said shaft, each of said members having engageable means, selector means comprising a plurality of spaced projections cooperating with said guide means and extending outwardly from a common side thereof, there being one of said projections for each of at least some of said members, each of said projections being engageable with the engageable means of one of said members to cause that member to rotate with said shaft when so engaged, spacing means associated with said projections for spacing them apart distances such that not more than one of said projections is engaged with the engageable means of one of said members for any position of said projections and said spacing means along said guide means, resilient means for urging said projections outwardly from said shaft, and means for moving said projections and said spacing means along said guide means and along said shaft.

8. A transmission comprising a rotatably-mounted shaft having a longitudinally-extending groove therein, a plurality of gears rotatably mounted on said shaft, at least some of said gears each having a recess which can communicate with said groove of said shaft, gear selector means comprising a carrier positioned within said groove of said shaft, said carrier having mounted thereon a plurality of spaced projections extending from a common side thereof and adapted to extend within the recesses of the gears to individually connect said gears and said shaft, resilient means movable with said carrier and extending outwardly into engagement with said projections, carrier-moving means on said shaft and engageable with said carrier to move said projections relative to said gears longitudinally of said shaft, and means for moving said moving means along said shaft to move said carrier and said projections carried thereby.

15. A transmission comprising a rotatably-mounted shaft having a plurality of gears rotatably mounted thereon, at least

some of said gears each having dogs adjacent said shaft, gear selector means comprising a carrier mounted for longitudinal movement on said shaft, a plurality of spaced projections mounted on said carrier for movement transverse to the longitudinal extent of said shaft, there being one of said projections for each of at least some of said gears, said carrier spacing said projections apart distances such that not more than one of said projections engages one of the gears for any position of said carrier on said shaft to enable not more than one gear to be engaged and rotatable with said shaft at any one time, and resilient means engageable with said projections for urging said projections from said carrier toward said gears.

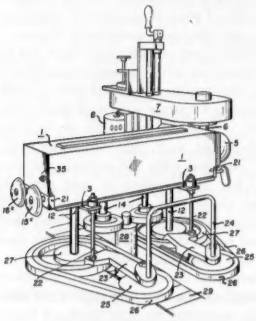
23. A transmission comprising a rotatably-mounted shaft having a longitudinally-extending groove therein, a plurality of gears rotatably mounted on said shaft, at least some of said gears each having a recess which can communicate with said groove of said shaft, gear selector means comprising a carrier positioned within said groove of said shaft, said carrier having a width slightly less than the width of said groove and having an outer arcuate surface with a radius of curvature substantially the same as the radius of said shaft, said carrier having mounted thereon a plurality of spaced projections extending from a common side thereof and adapted to extend within the recesses of the gears, resilient means movable with said carrier and extending outwardly into engagement with said projections, carrier-moving means on said shaft and engageable with said carrier to move said projections relative to said gears longitudinally of said shaft, and means for moving said moving means along said shaft to move said carrier and said projections carried thereby.

3,890,851

CONTAINER-CAP APPLYING MACHINE

Nathan Lanes, 400 Rugby Rd., Brooklyn, N.Y. 11226

Filed Mar. 23, 1973, Ser. No. 344,549
Int. Cl. F16h *35/08*
U.S. Cl. 74—400 2 Claims



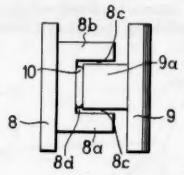
1. In a contaner cap applying machine, an open bottom caisng, two sets of two brackets each within said casing and carrying depending pulley shafts and driven gears thereon, a spline drive shaft between the two sets of brackets and having drive gears engaging said driven gears, power means for driving said spline shaft, rotatable toothed shafts, one for each set of brackets and adapted to move them for spacing adjustment of said brackets, and means for supporting the brackets at their lower ends comprising elements at least one of which is operable to force said brackets against the casing base walls, and to release said force preliminary to adjust the spacing of either or both sets thereof.

3,890,852

DRIVE FOR CONVERTERS, ROTATING DRUMS, PLATE CONVEYORS OR THE LIKE

Walter Schroder, 463 Bochum-Stiepel, Stemmannsfeld, Germany

Filed July 6, 1973, Ser. No. 377,016
Int. Cl. F16h *57/00*
U.S. Cl. 74—410 2 Claims



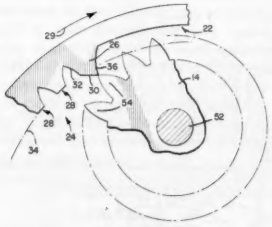
1. A drive mechanism for transmitting rotary motion to a large rotary driven member comprising in combination:
a larger driven gear mounted for rotation about an axis;
first and second spaced pinion gears in driving mesh with said larger gear;
a movable rigid carrier plate for said pinion gears having movement in a plane transverse of the axis of said larger gear with said gears rotatably mounted thereon at fixed locations so that said pinions move with said plate;
stop means limiting the movement of said carrier plate having stop members facing in a direction generally radially toward the axis of the larger gear to control the depth of the mesh between the pinions and larger gear;
and cushioning means yieldingly cushioning the movement of said carrier plate.

3,890,853

GEAR MECHANISM FOR PRODUCING PERIODIC ROTATION

Albert John Feltz, Rochester, N.Y., assignor to The Singer Company, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,354
Int. Cl.[2] F16H *55/04, 1/06, 55/06, 27/04*
U.S. Cl. 74—435 10 Claims



1. A gear mechanism comprising
a rotatable ring gear having along its inner periphery at least one segment without teeth and at least one segment with at least one tooth
said segment including an asymmetrically pointed lead-in tooth having a leading face and a trailing face; and
a rotatable pinion gear located within and engageable with the toothed segment of the ring gear and having a plurality of teeth extending radially therefrom.

3,890,854

ROLLING BEARING ASSEMBLY, IN PARTICULAR FOR A STEERING SHAFT OF AN AUTOMOBILE VEHICLE

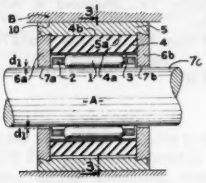
Alfred Pitner, Paris, France, assignor to Nadella, France, a part interest

Filed June 14, 1973, Ser. No. 369,842

Claims priority, application France, June 26, 1972, 72.23014

Int. Cl. B62d 1/18; F16c 27/04, 35/04

U.S. Cl. 74—492 10 Claims



1. A vehicle steering assembly for orienting steering road wheels of the vehicle comprising a steering wheel for the driver of the vehicle, a steering shaft carrying said steering wheel and a rolling bearing assembly comprising means defining a rolling bearing inner raceway associated with said shaft, a ring arrangement of rolling elements around the raceway, a steering wheel shaft mount for connection to the body of the vehicle, said mount defining a bore, a thin sleeve located within the bore and defining an outer raceway for the rolling elements, elastically yieldable support means interposed between the sleeve and the bore for radially supporting the sleeve in an elastically yieldable manner with respect to the bore, means defining at least one first abutment surface of cylindrical shape coaxial with the inner raceway and associated with the bore, means defining a second abutment surface associated and radially movable with the shaft, the elastically yieldable support means being capable of elastically yielding to a given maximum radial extent after which extent impairment of the elastically yieldable support means occurs, and the radial distance between said first and second abutment surfaces being less than said maximum radial extent of said elastic yield to preclude impairment of said elastically yieldable support means but sufficient to allow said shaft radial movements relative to said mount, in opposition to the action of said elastically yieldable support means, which are brought about by vibrations and forces normally to be expected in vehicle use, whereby said elastically yieldable support means are protected from impairment by the effect of abnormal forces on said shaft.

3,890,855

FULLY AUTOMATIC TORQUE RESPONSIVE PLANETARY GEARBOX WITH PLURAL COUNTERSHAFTS

Hans Ivar Reenskoug, 63 Skogsgatan, Linkoping, Sweden

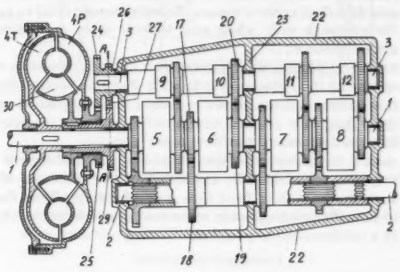
Filed May 20, 1974, Ser. No. 471,534

Claims priority, application Sweden, May 23, 1973, 7307241

Int. Cl. F16h 47/00, 47/08

U.S. Cl. 74—730 3 Claims

1. A fully automatic gearbox comprising a torque converter having a rotary pump element and a rotary turbine element, said gearbox including a primary shaft, an output shaft, and a return shaft, said shafts cooperating with said torque converter and with a plurality of planetary gearings to provide at least two mechanical steps of gear changing each of which includes a planetary gearing having three rotary members, the primary shaft of the gearbox being coupled to one of the rotary elements of the torque converter and to a first one of the three rotary members in each of said plurality of planetary gearings, said planetary gearings being arranged one after the other, one for each step of gear changing, a plurality of free wheel couplings, one for each gear changing step, a second one of the rotary members of each of the planetary gearings being arranged to cooperate, directly or via the free wheel coupling of the associated gear changing step, either with the output shaft of the gearbox or with the return shaft, said return shaft being coupled to another rotary element in the torque converter, transmission of motion and gear change being



operative to cause the pump element and the turbine element of the torque converter to rotate in the same direction with the pump element having in all operating conditions a higher speed than the turbine element, the third rotary member of each of the planetary gearings being arranged to cooperate directly or via the free wheel coupling of the associated step of gear changing either with the return shaft or with the output shaft of the gear box.

3,890,856

CREEP PREVENTING HYDRAULIC CONTROL CIRCUIT FOR VEHICLE AUTOMATIC TRANSMISSION

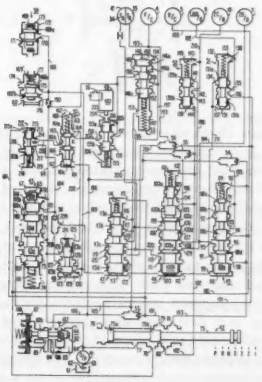
Toshiyuki Miyauchi, and Kunio Ohtsuka, both of Yokohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama, Japan

Filed Oct. 24, 1973, Ser. No. 409,199

Claims priority, application Japan, Nov. 2, 1972, 47-109515

Int. Cl. B60k 23/00; F16h 3/74

U.S. Cl. 74—869 5 Claims



1. In a hydraulic control circuit for a vehicle automatic transmission of the type having a hydraulic pressure source, pressure regulating means to regulate the hydraulic pressure from said source, a plurality of shift control valves which selectively transmit hydraulic fluid to a plurality of frictional elements to cause engagement and disengagement of said

elements to change the output gear ratio of said transmission, the improved creep-preventing mechanism comprising:

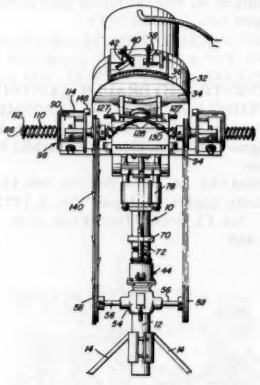
a. a first fluid flow control means;
b. a second fluid flow control means;
c. a third fluid flow control means;
d. means connecting said first, second and third flow control means in series;
e. electric means to control said first fluid control means in response to the position of the vehicle throttle such that said first fluid control means allows hydraulic fluid to pass therethrough only when said throttle is in a predetermined position;
f. means to control said second flow control means in response to the vehicle throttle such that said second fluid flow control means allows hydraulic fluid to pass to said third fluid flow control means only when said throttle is in a predetermined position; and
g. means to control said third fluid flow control means in response to a manually controllable gear selector valve such that said third fluid flow control means allows fluid to pass therethrough only when said gear selector valve is in a predetermined position.

3,890,857

AUTOMATIC CHAIN SHARPENER

Jack F. Simington, Star Rt. Box 141, Chiloquin, Oreg. 97624

Continuation-in-part of Ser. No. 392,889, Aug. 30, 1973. This application June 20, 1974, Ser. No. 481,447
Int. Cl. B23d *63/16*
U.S. Cl. 76—25 A **4 Claims**



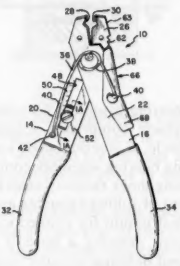
1. A chain saw chain sharpening device comprising a support, a rotary grinding head journaled from said support, a pair of chain support mounts mounted on said support and including portions thereof on opposite sides of said head supported for shifting along a first path extending transversely of the axis of rotation of said head, said support mounts including means for supporting a saw chain for guided lengthwise adjustment of said chain along a second path transverse to said axis and said first path, first driven means drivingly connected to said support mount portions for reciprocating the latter along said first path and second drive means for intermittently advancing said chain in timed relation to reciprocation of said support mount portions, an elongated support member rotatably supported from said support and extending and lengthwise reciprocal along said first path, said support mount portions including support discs mounted on said support member for rotation and reciprocation with said support member and about each of which a saw chain may be trained, said first drive means including a follower and being drivingly connected to said support member for reciprocation of the latter, said first drive means including a lost motion connection with said support member, and adjustable limit means carried by said support and engageable by said support discs to limit movement of the latter away from the axis of rotation of said grinding head, said lost motion connection including a pair of opposing springs connected between said follower and said support discs.

3,890,858

WIRE STRIPPER

Gustaf Rudolph Lawson, Willingboro, N.J., and John H. Stuart, Levittown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 20, 1974, Ser. No. 471,414
Int. Cl. H02q *1/12*
U.S. Cl. 81—9.5 R **11 Claims**



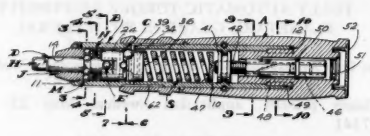
1. In a wire stripper of the type comprising first and second arms pivotally connected to each other to define two facing jaws with wire stripping means thereon and two handles with means for biasing the handles and jaws to an open position, the improvement comprising first means for limiting the minimum opening between said jaws to a predetermined range of openings, second means for selectively limiting the maximum opening between said handles over a predetermined range of openings said second means cooperating with said first means throughout the range of openings to prevent said arms from spreading.

3,890,859

TORQUE DRIVER TOOL

Bosko Grabovac, Mission Viejo, and Ivan N. Vuceta, San Gabriel, both of Calif., assignors to Consolidated Devices, Inc., El Monte, Calif.

Filed Aug. 9, 1974, Ser. No. 496,099
Int. Cl. B25b
U.S. Cl. 81—52.4 R **12 Claims**



1. A torque driver tool comprising an elongate tubular body with front and rear ends, a block in the front end of the body and having a central, axially extending opening, an elongate drive shaft rotatably engaged in said opening and having a work engaging front end projecting from the block and body and a rear end projecting into the body, thrust bearing means between the shaft and block, a driven plate with a rear surface and radially extending and rearwardly opening channels rotatably positioned in the body rearward of the block, a thrust bearing between the block and drive plate, coupling means coupling the rear end of the shaft and drive plate in rotary driving engagement, radially extending cam parts engaged in

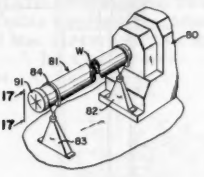
the channels in the drive plate in rotary driving engagement therewith and having convex portions projecting rearwardly from the rear surface, an axially shiftable drive plate with a front surface in the body in rearward spaced relationship with the driven plate and having a radially extending forwardly opening channel, an elongate radially extending ball engaging drive bar fixed in the body between the plates and having a rear portion slidably engaged in the forward portion of the channel in the drive plate, circumferentially spaced balls positioned between and normally engaging the front and rear surfaces and engageable with the drive bar and the convex portions of the cam parts and spring means in the body rearward of the drive plate and normally yieldingly urging the drive plate forwardly in the body toward the driven plate with the balls in bearing engagement therebetween.

3,890,860

SILENCER AND SUPPORT MEANS FOR A METAL WORKPIECE DURING MACHINING THEREOF

Daniel J. Gordon, 22132 Treadwell, Farmington, Mich. 48024, assignor to Dayco Corporation, Dayton, Ohio

Filed May 21, 1973, Ser. No. 361,933
Int. Cl.[2] B23B *25/00*
U.S. Cl. 82—38 A **2 Claims**



1. A device for silencing and supporting a metal workpiece during the machining thereof comprising an inner tubular member; an outer tubular member; a flexible foam product made of an elastomeric material and provided in the space between said tubular members, said flexible foam product filling the entire volume between said tubular members and serving to absorb and trap sound as well as absorb vibrations of said workpiece; and an end cap fastened to an end portion of said device and serving as a silencing boot, said end cap having a planar end wall adjoined by a cylindrical wall which frictionally engages an outer end portion of said outer tubular member to detachably fasten said end cap to said device, said end cap being made of an elastomeric material and having a plurality of integral flaps defined in said end wall, said flaps being normally arranged coplanar with each other and being foldable transverse their associated plane to allow movement of said workpiece axially through said inner tubular member.

3,890,861

METHOD AND APPARATUS FOR SAWING A PANEL INTO PORTIONS

Fritz Gebhardt, Nurtingen, Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nurtingen, Germany

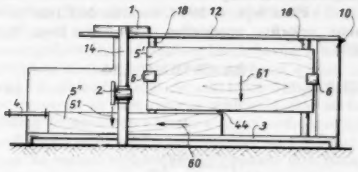
Filed Feb. 1, 1974, Ser. No. 438,557
Claims priority, application Germany, Feb. 6, 1973, 2305673; Dec. 1, 1973, 2359988
Int. Cl. B27b *5/06*
U.S. Cl. 83—23 **3 Claims**

1. A method of dividing a substantially planar panel having an edge which comprises:

a. standing said panel on a support in a position in which said edge is at least approximately horizontal, and the panel extends upward from said edge;

b. first cutting said panel spacedly parallel to said edge into a lower section and an upper section while securing said upper section in the position thereof relative to said support, whereby another edge is formed on said upper section;

c. thereafter cutting said lower section transversely to the direction of said first cutting into at least two pieces;



d. removing said pieces from said support;

e. lowering said upper section until said other edge rests on said support; and

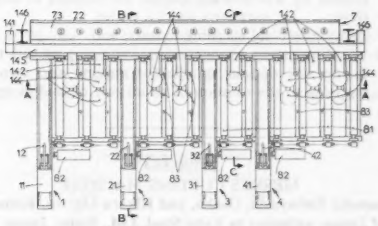
f. cutting said upper section spacedly parallel to said other edge into two parts.

3,890,862

APPARATUS FOR SHEARING THE EDGES OF A SHEET OF METAL

Bernard Lhenry, Le Creusot, France, assignor to Creusot-Loire, Paris, France

Filed Oct. 3, 1973, Ser. No. 403,022
Claims priority, application France, Oct. 26, 1972, 72-38005
Int. Cl. B65h *9/00*
U.S. Cl. 83—71 **11 Claims**



1. Apparatus for shearing the edges of a sheet comprising:

an edge shearer,

a table adjacent the shearer for supporting a sheet,

at least one carriage guided for movement in a direction perpendicular to the cutting line,

means for gripping an edge of a sheet, the gripping means being mounted at an extremity of at least one carriage on that side adjacent the shears,

motor driving means for linear displacement of each carriage in opposite senses,

means for rotating a sheet adjacent the shears, after cutting a first edge of a sheet,

detectors for detecting the passage of the edge of a sheet adjacent the cutting line, each situated at an equal direction from the cutting line in the direction of displacement of a carriage,

detectors mounted at the end nearest to the shears of each carriage operably by the edge of a sheet remote from the cutting line for controlling the advance of the carriage in relation to the said edge,

position coders for controlling position of each carriage,

and means for controlling operation of the apparatus.

3,890,863

STAMPING MACHINE FOR SLOTTING CORE PLATES

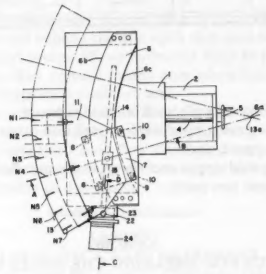
Markus Reihle, Weingarten, and Erich Harsch, Baindt, both of Germany, assignors to Maschinenfabrik Weingarten AG, Weingarten, Germany

Filed Sept. 4, 1974, Ser. No. 503,160

Claims priority, application Germany, Sept. 5, 1973, 2344697

Int. Cl.[2] B26D 7/06

U.S. Cl. 83—71 20 Claims



1. A stamping machine for slotting annular segment-shaped plates, including a carriage for supporting the plate to be slotted; means for movably supporting the carriage; an arcuate template in engagement with the carriage for guiding the carriage in a circularly arcuate path, the improvement comprising:

a. a drive spindle having a driven side and a driving side;

b. means connecting said driving side of said spindle to said carriage for displacing said carriage upon motion of said spindle by transmitting spindle movements to said carriage;

c. first and second stepping motors; and

d. coupling means connecting said stepping motors to said driven side of said spindle for moving said spindle in response to the rotation of either one of said motors.

3,890,864

MESHES CUTTING MACHINE

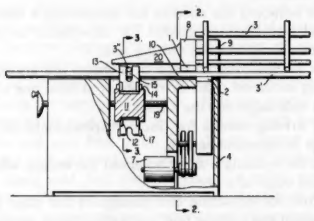
Yasunobu Kobayashi, Osaka, and Hikaru Ogawa, Kobe, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed June 5, 1974, Ser. No. 476,534

Claims priority, application Japan, June 5, 1973, 48-64259

Int. Cl. B23d 15/04, 33/02

U.S. Cl. 83—162 8 Claims



1. A meshes cutting machine provided with a pair of cooperating cutting edges for cutting meshes consisting of wire members, and with a mechanism for moving said meshes, comprising:

a guide groove extending along the extension line of the cutting line of said meshes in the advancing direction of said meshes; and

a drive pawl mechanism located on the open side of said guide groove and adapted to shift the lengthwise members of said meshes in parallel with said guide groove.

3,890,865

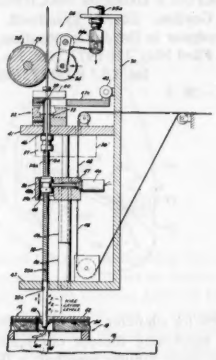
SYSTEM FOR DISPENSING AND CUTTING STRAND MATERIAL

John W. Tarbox, Malibu; Walter E. Hinds, Los Angeles, and Rodolfo Castro, La Palma, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 274,160, July 24, 1972, Pat. No. 3,844,462. This application Oct. 3, 1973, Ser. No. 403,299

Int. Cl. B26d 1/08

U.S. Cl. 83—198 8 Claims



1. A dispensing head for strand material comprising:

means for supplying strand material;

means for feeding said strand material including means for drivingly engaging said strand material, the feeding means includes a feed tube including means for supporting said feed tube to receive strand material cut to the desired length and means for producing axial movement of the feed tube to position the end thereof for dispensing the strand material; and

means for receiving and cutting the driven strand material to a desired length, said latter means including axially aligned annular members having annular opposing cutting edges for passing the strand material and slidable for cutting the strand material.

3,890,866

DEVICE FOR CUTTING A CONTINUOUS STRIP OF PAPER

Jean Verjux, Pavillons Sous Bois, France, assignor to Usines Decoufle, Paris, France

Filed Feb. 4, 1974, Ser. No. 439,213

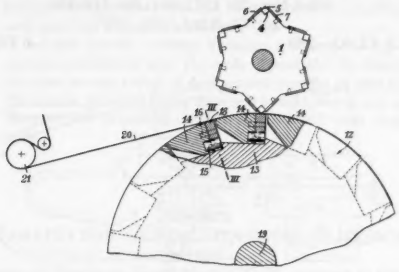
Claims priority, application France, Feb. 22, 1973, 73.06310

Int. Cl. B26d 25/12

U.S. Cl. 83—346 5 Claims

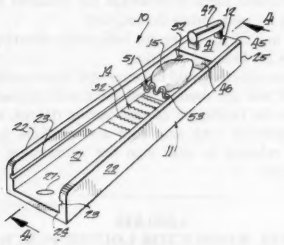
1. Device for cutting a continuous strip of paper into sections having the same predetermined length, which comprises cutting elements mounted on a rotary holder adapted to cut a strip of paper travelling continuously against the surface of a likewise rotary counter-drum, spaced cutting inserts so mounted that the cutting elements engage a registering insert when cutting the strip of paper, a plurality of pins correspond-

ing to said inserts mounted respectively in said counter-drum to extend in a direction parallel to the peripheral tangent of



said counter-drum, each of said cutting inserts being mounted to pivot on one of said pins during the operation of the device.

3,890,867
POTATO CHIP SLICING DEVICE
Mary P. Wilson, 6241 S.W. 20th Ter., Miami, Fla. 33155
Filed Mar. 11, 1974, Ser. No. 450,143
Int. Cl. B26d *4/44*
U.S. Cl. 83—404 **2 Claims**



1. A potato peel slicing device intended for the slicing of a potato into thin slices of uniform thickness for the making of potato chips, and the like, the device comprising, in combination:

an elongated longitudinally extending track having a substantially U-shaped transverse cross-section shape formed of a horizontally extending bottom surface and a pair of opposed vertically extending side wall surfaces defining a runway therebetween;

an opening in said bottom surface extending longitudinally thereof and between opposite side wall surfaces and disposed approximately midway between opposite ends of said bottom surface;

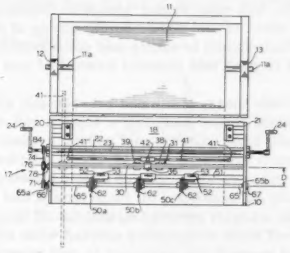
said track having a front end and a back end, a vertically extending stop member disposed adjacent to said back end and interconnecting said side wall surfaces and projecting to a level above the heighth of the bottom surface, each of said track side wall surfaces being provided with a longitudinally extending slot extending from end to end thereof parallel to said bottom surface and spaced approximately midway between said bottom surface and the top edge of said side wall surfaces and wherein said frame assembly is comprised of a generally U-shaped member having rod-like leg members projecting horizontally and of a dimension adapted to be slidingly received in an associated one of said grooves for guiding said frame assembly longitudinally along said runway;

a plurality of cutting blade members disposed in said bottom surface opening and extending transversely of said track between said opposite side wall surfaces, said cutter blades being inclined at a direction upwardly of said bottom surface and inclined toward said track back end, the spacing between each of the blades being substantially identical, said blades having a leading cutting edge which is disposed at a level above the level of the interior surface of said bottom surface;

a rectangularly shaped pushing block having a top surface, a bottom surface, opposed side surfaces, a back surface, and a front leading surface, said block being of a width to be received in said runway with said side surfaces in sliding juxtaposition with the interior surfaces of said side wall surfaces of said track whereby said pushing block may be moved reciprocally in opposite directions along said runway between said front end and said back end of said bottom surface, the front leading edge of said pushing block being beveled inwardly and downwardly from said top surface to said bottom surface, and a cylindrical handle member being affixed to said top surface by a pair of longitudinally spaced apart bracket means with the handle adapted to be readily grasped in the hand of an individual to effect the reciprocal movement of said pushing block along said runway; and

frame means associated with said pushing block and projecting forwardly of the front surface thereof and adapted to receive a potato therein for retaining the potato relative to the pushing block whereby movement of the pushing block from the back end to the front end will push the potato over the cutting blades to slice the potato into a plurality of thin strips of uniform thickness suitable for the making of potato chips, said base member of said frame assembly being formed of a cylindrical rod bent in the desired configuration of a general sine wave and having bottom loop portions terminating adjacent the interior surface of said track bottom surface.

3,890,868
INSULATION CUTTER
Lloyd P. Pickler, 634 McKee St., Albemarle, N.C. 28001
Filed Apr. 24, 1974, Ser. No. 463,763
Int. Cl. B26d *3/12, 1/20*
U.S. Cl. 83—408 **3 Claims**



1. A cutting apparatus for cutting thick, fibrous insulation type material fed from a substantially long continuous supply roll into pieces of predetermined and variable widths and length comprising:

a. a work table having a supporting frame and a table surface;

b. a roll support extending across the end of said table opposite said table surface and rotatably mounting a continuous supply roll of said material;

c. a pair of upper and lower opposed rollers mounted adjacent and forward of said roll support and proximate said table surface and extending across said table, the upper of said rollers being an idler roller and being adjustably spring loaded towards said lower roller, the lower of said rollers having handle operator means and a frictional

surface for gripping the width of said material, said rollers being adapted to withdraw a predetermined length of said material from said roll and force such length onto said table surface;

d. a plurality of slitting blade arrangements adjustably mounted on a rod extending across and above said table surface and being adjacent and forward of said rollers, each said slitting blade arrangement including:

1. bracket means adjustably secured to said mounting rod and providing below said rod a vertically and laterally adjustable slitting blade mount;

2. a thin slitting disc blade rotatably positioned on said slitting blade mount at a selected lateral position and height above said table corresponding to a preset width and material thickness and adapted to slit said thickness to such preset width as said material is pushed by said rollers against the cutting edge of said slitting blade, the longitudinal spacing between said rollers and slitting blade being minimal to minimize buckling of said material as it approaches said blade; and

3. presser foot means providing a pair of surfaces for slidably engaging the top of the material immediately adjacent the sides of said blade at some predetermined upward limiting position at the point of slitting;

e. an auxiliary material pulling arrangement including an auxiliary shaft extending across said table surface immediately beneath said slitting blade arrangements, and rotatably supported by said frame, said shaft having a plurality of frictional surfaced collar members, one for each said slitting blade arrangement, adjustably mounted thereon and arranged for being driven by said auxiliary shaft at locations corresponding to the selected lateral positions of said slitting blade arrangements, each said collar member having a groove for receiving a respective said slitting blade therein such that the bottom surface of said material during slitting is engaged on either side of said blade by a respective collar member peripheral surface and its upper surface by a said slitting blade edge;

f. belt and pulley drive means connecting said lower roller and said auxiliary shaft member such that rotation of said lower roller by said handle means in turn causes said shaft member and said collar members to rotate, to allow said supply material as it passes said slitting arrangements to simultaneously contact said collar members and to be pulled through said slitting blades to supplement the pushing effort of said rollers during slitting of the material, and subsequent to slitting said collar members being effective to push said material forward of said auxiliary shaft;

g. cut-off blade means positioned between said rollers and slitting blade means including a support rail extending across said table adjacent said rollers, a wheel bracket arrangement providing a set of wheels adapted to ride said rail and a bracket supported by said wheels providing a vertically adjustable cut-off blade mount, and a cut-off disc blade rotatably mounted on said cut-off blade mount, said cut-off blade means being adapted when adjusted to a vertical position corresponding to said material thickness and pushed across said table to cut said material to a preset length corresponding to the length of said material drawn onto the said table past said rail; and

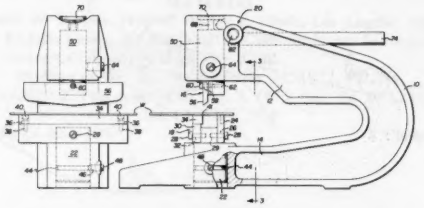
h. a horizontal handle bar mounted for rotation about a vertical axis above and on said wheel bracket arrangement and having upright hand grip means at the ends thereof, said handle bar being adapted to move said cut-off blade across said material from either side of said table and when not in use said handle being adapted to being rotated and releasably held in a horizontal plane to a position substantially perpendicular to said rail while said cut-off blade remains positioned at one side of said table thereby leaving aisle space on both sides of said table free of the obstruction of said handle and the central area of said table free of the obstruction of said cut-off blade.

3,890,869

LOUVER CUTTER

Eugene Van Cleave, Redford, Mich., assignor to Van Mark Products Corporation, Farmington Hills, Mich.

Filed Nov. 29, 1972, Ser. No. 310,046
Int. Cl. B26d *5/08, 7/10*
U.S. Cl. 83—559 **6 Claims**



1. In an apparatus for punching louvers or the like in workpieces, said apparatus including a frame having upper and and lower legs, a ram mounted for reciprocation in said upper frame leg, said ram having a punch secured thereto, and die means mounted on said lower leg, the improvement of means for jointly indexing said ram and said die means comprising: a spring detent threaded through said frame for engaging and resiliently holding said ram in an indexed position;

said spring detent of sufficient resiliancy for releasing said ram from an indexed position upon rotation of said ram with sufficient force to override the resilient holding of said ram by said spring detent; and

a fastener in said lower leg for releasably securing said die means in an indexed position;

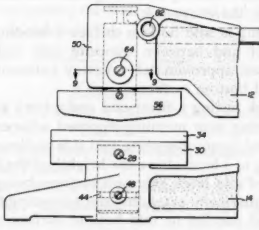
so that upon releasing said fastener and positioning said ram adjacent said die means, and then indexing said ram to override the resilience of said spring detent, said die is jointly indexed with said ram and said die is properly aligned relative to said ram for subsequent punching operations.

3,890,870

FREE TRAVEL HANDLE FOR LOUVER PUNCH OR THE LIKE

Eugene Van Cleave, Orchard Lake, Mich., assignor to Van Mark Products Corporation, Farmington Hills, Mich.

Division of Ser. No. 310,046, Nov. 29, 1972. This application May 6, 1974, Ser. No. 467,012
Int. Cl. B26d *5/08*
U.S. Cl. 83—616 **4 Claims**



3. In a portable machine for stamping louvers or the like in sheet metal stock, said machine including a frame, anvil means, and a ram reciprocable between first and second positions and having a removable cutting member secured thereto, the improvement comprising:

handle means including a first portion engaging said ram for positive motion of said ram between said first and second

positions, and having a second portion for limited free pivotal travel with respect to said first portion,

said first handle portion includes a rod having a tapped hole, and

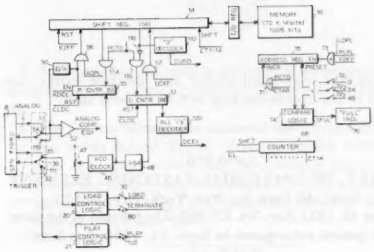
a ball and integral link, said link being threaded in said hole and said ball engaging said ram,

said second handle portion includes a sleeve having an arcuate peripheral slot, the ends of said slot for limiting the free pivotal travel of said second portion of said handle means, said rod being disposed in said sleeve and said integral link extending through said slot into said tapped hole.

3,890,871
APPARATUS FOR STORING SEQUENCES OF MUSICAL NOTES

Thomas E. Oberheim, Santa Monica, Calif., assignor to Oberheim Electronics Inc., Santa Monica, Calif.

Filed Feb. 19, 1974, Ser. No. 443,292
Int. Cl. G10h *1/00;* **G10f** *5/00*
U.S. Cl. 84—1.01 **14 Claims**



1. In combination with an electronic music synthesizer having a keyboard and means responsive to the playing of each key for producing a trigger pulse and an analog voltage level representative of pitch, a sequencer apparatus responsive to the playing of a sequence of keys for storing information describing the melody represented thereby, said sequencer apparatus comprising:

duration logic means responsive to each trigger pulse subsequent to the initial trigger pulse in a sequence, for providing a multibit digital code representing the time duration since the immediately preceding trigger pulse;

level logic means for providing a multibit digital code representing the level of analog voltage after each trigger pulse;

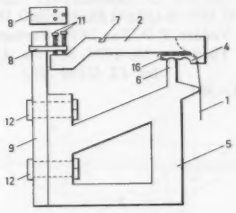
memory means comprised of a plurality of word locations each for storing a multibit word; and

means responsive to each trigger pulse provided by said duration logic means subsequent to the initial trigger pulse in a sequence for successively storing digital words in sequential locations of said memory means, each word comprised of a first digital code representative of time duration provided by said duration logic means and a second digital code representative of analog voltage level provided by said level logic means.

3,890,872
DEVICE FOR STRINGING AND TUNING OF STRINGS IN PIANOS, GRAND PIANOS, HARPSICHORDS, ZITHERS AND THE LIKE

Gunnar O. Sjöstrand, Atvidaberg, and Staffan G. Sjöstrand, Linkoping, both of Sweden, assignors to Musikindustriell Forskning MIFO AB, Linkoping, Sweden

Filed Apr. 5, 1974, Ser. No. 458,403
Int. Cl.² G01C *3/10*
U.S. Cl. 84—207 **6 Claims**

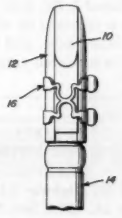


1. In a device for stringing and tuning of the strings in pianos and like stringed instruments, wherein an elongated rocker is journalled on a fixed arcuate abutment to be swung about an axis transverse to the direction of the string, thhe string being suspended from the rocker at a point spaced from one side of the axis of said abutment, the rocker being in engagement with adjustable tuning means at a location spaced from the other side of said axis, the improvement which comprises a movable clamping element connected with said rocker, the lower surface of said clamping element being in sliding contact with said abutment, the upper surface of said clamping element being disposed below the lower surface of said rocker for resiliently clamping the string between said element and rocker.

3,890,873
LIGATURE

Robert L. Harrison, 204 Yarmouth Dr., Tiffin, Ohio 32730

Filed June 12, 1974, Ser. No. 478,729
Int. Cl. G10d *9/02*
U.S. Cl. 84—383 **8 Claims**



1. A ligature for a reed instrument, comprising, in combination:

a. first and second split bands, each of these bands having a pair of ends arranged forming a split;

b. clamp means mounted on the ends of the bands and arranged bridging the splits for drawing the ends of the bands toward and away from one another and permitting the bands to be tightened on and removed from a mouthpiece of a reed instrument; and

c. a web connected to the bands at points thereof spaced from the clamp means, the web arranged forming a face for retainingly contacting a reed and holding the reed on the mouthpiece, the web including a pair of substantially

U-shaped members each having a bight portion and a pair of legs extending codirectionally from the bight portion, the members being connected together at the bight portions thereof, with the legs of each of the members extending away from the legs of the other of the members and connected to a respective one of the bands, corresponding legs of each U-shaped member being arranged in common planes.

3,890,874

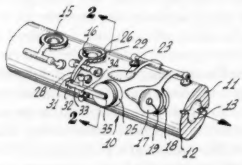
KEYING MECHANISM FOR WIND INSTRUMENTS

Charles N. Vedder, P.O. Box 2075, Ventura, Calif. 93001

Filed Jan. 10, 1974, Ser. No. 432,590

Int. Cl. G10d *7/02*

U.S. Cl. 84—384 **3 Claims**



1. In a flute having a tubular body with a plurality of holes therethrough selectively coverable by a player's fingers, and including an E flat key operable to open a normally closed E flat hole, the improvement wherein:

the body includes an additional E flat hole at substantially the same axial location as the original E flat hole; and

the flute further includes

a cover for said additional E flat hole,

a key operable simultaneously with the covering of a particular existing hole,

mechanical means linking said key with said cover, and

resilient means urging said cover open;

whereby said additional E flat hole is automatically uncovered as said key is released by removal of a finger from the particular existing hole, and simultaneous operation of the E flat key is rendered unnecessary.

3,890,875

OCTAVE LOCATOR FOR KEYBOARD AND NOTE READING

Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93710

Filed July 24, 1974, Ser. No. 491,258

Int. Cl. G09b *15/02*

U.S. Cl. 84—471 **6 Claims**

1. A music teaching aid comprising:

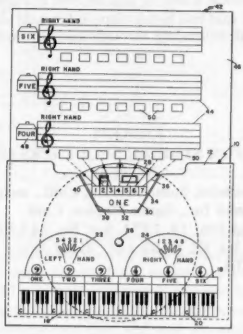
a. an envelope having a front panel and a rear panel;

b. said front panel having a representation thereon of a piano keyboard divided into numbered octaves;

c. a dial rotatably mounted to the rear surface of said front panel and having a plurality of peripheral sectors provided in the same quantity as said numbered octaves and being numbered to individually correspond therewith;

d. said front panel having a portion cut away to expose any selected one of said sectors;

e. an insert sheet insertable into said envelope and being of height dimension to have a first portion extending from said envelope when a second portion is fully inserted on said envelope and having at least one musical staff on said first portion, whereby the user can rotate the dial to select a particular numbered sector and inscribe notes contained in the corresponding octave on said staff.



3,890,876

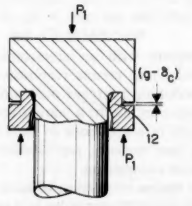
TWO-PART, TWO-MATERIAL FASTENING ELEMENT

Norman C. Dahl, 40 Fern St., New York, N.Y. 02173

Filed June 18, 1973, Ser. No. 370,965. The portion of the term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

Int. Cl. F16b *31/02*

U.S. Cl. 85—62 **13 Claims**

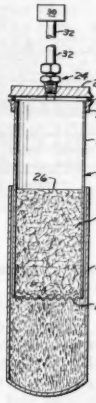


1. A fastener indicator device which comprises a yielding section therein subject to plastic deformation on application of a predetermined compressive force and characterized by a groove or gap therein, which device is further characterized by the yielding section composed of a material which has been workhardened by the application of a loading force of the same character as that force to which the device is subject in use, such loading force slightly less than or equal to the said predetermined force, but greater than the force which would cause initial yielding of the material, whereby in use a change in the dimension of the groove or gap indicates that the fastener carries the predetermined force.

3,890,877
STAPLE ORIENTING APPARATUS

Edwin L. Lista, Roseville, and Kenneth S. Williams, Sacramento, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Continuation of Ser. No. 521,757, Jan. 18, 1966. This application Oct. 6, 1969, Ser. No. 866,088
Int. Cl. C06b *21/00*
U.S. Cl. 86—1 **5 Claims**



1. An apparatus for casting uncured solid propellant having elongated metal staples randomly dispersed therein comprising:

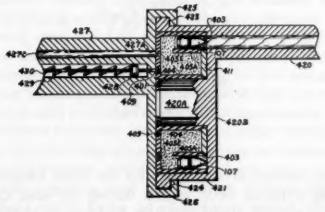
a tube for containing the uncured solid propellant; and

a fine mesh screen fixedly attached to the bottom end of said tube, said screen having openings therein whereby when the solid propellant passes through said screen, the metal staples of said propellant are oriented in the direction of propellant flow.

3,890,878
AMMUNITION AND WEAPON SYSTEMS

Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 19038

Division of Ser. No. 239,595, March 30, 1972, Pat. No. 3,857,339. This application Feb. 21, 1974, Ser. No. 444,595
Int. Cl.² F41F *3/02*
U.S. Cl. 89—1.7 **6 Claims**



1. In a weapon system having a substantially cylindrical barrel and breech means rearward of said barrel, said barrel having a longitudinal axis along which a projectile is launchable,

said breech means having a reciprocable firing pin, said firing pin having a longitudinal axis laterally offset from said barrel and barrel axis,

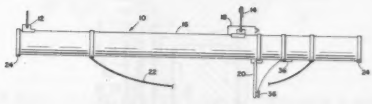
a cylinder housing integral with said barrel and having an internal rearwardly extending substantially central stub, and

said breech means having a recoil vent, said recoil vent being substantially in operative alignment with said barrel.

3,890,879
ANTI-TANK LAUNCHER

Lonnie L. Looger, Madison, and Wiley B. Vickers, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 21, 1973, Ser. No. 418,002
Int. Cl. G41f *3/02*
U.S. Cl. 89—1.816 **1 Claim**

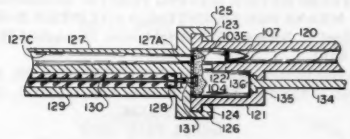


1. A lightweight man-transportable rocket launcher comprising: a tube for storing and launching a rocket; a firing sight movably attached to said tube, said firing sight including a foldup forward and rear sight pivotally attached to said tube; means for storing said sight when not in use; a foldup shoulder recoil stop, and end caps for closing said tube and protecting a rocket in said tube until said launcher is activated for use, said end caps being provided with a removable end wall having scoring thereon to define a tear strip and to tab secured to the leading edge of said tear strip to actuate removal of said end wall.

3,890,880
AMMUNITION AND WEAPON SYSTEMS

Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 19038

Division of Ser. No. 239,595, March 30, 1972, Pat. No. 3,857,339. This application Feb. 21, 1974, Ser. No. 444,581
Int. Cl.² F41F *3/02*
U.S. Cl. 89—1.705 **18 Claims**



1. In a weapon system having a substantially cylindrical barrel and a capsule chamber integral therewith, said barrel having a longitudinal axis, said chamber being laterally offset from said barrel and barrel axis,

longitudinally translatable breech means adapted to be rotated for securement in a locking position with said barrel and chamber, said breech means having a longitudinal passage for receiving a firing pin, said passage being in alignment with said chamber when said breech means is secured in locking position, and

a recoil vent provided in said breech means, said recoil vent being in alignment with said barrel when said breech means is in locking position.

3,890,881

AUTOMATIC FIRING WEAPON

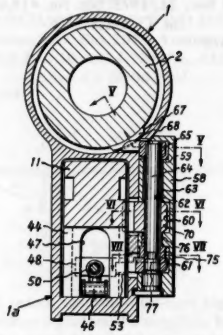
Ernst Hurlemann, Zurich, and Jurg Zellweger, Neerach, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon Buhrle & Co., Zurich, Switzerland

Filed Aug. 23, 1973, Ser. No. 390,953

Claims priority, application Switzerland, Aug. 31, 1972, 12889/72

Int. Cl. F41d *5/12*

U.S. Cl. 89—176 5 Claims



1. An automatic firing weapon comprising a housing, a weapon barrel movable relative to said housing, a breechblock mechanism including a breechblock displaceably mounted in said housing, a pivotable shaft, a safety lever pivotably mounted in the housing on said pivotable shaft, said breechblock having a stop, the safety lever in cooperative action with the stop at the breechblock preventing recoil movement of the breechblock, a control cam pivotally mounted in said housing on said pivotable shaft, the control cam and said safety lever being connected with said pivotable shaft, an unlocking lever mounted on said pivotable shaft, means for placing said unlocking lever in driving connection with said pivotable shaft and means associated with said breechblock for manually actuating said unlocking lever, said barrel acting by means of a control surface thereon upon the control cam sliding upon said control surface for displacing the safety lever into a position releasing the breechblock after firing a shot.

3,890,882

FLUID DEVICE HAVING PLASTIC HOUSING AND MEANS FOR MOUNTING A CYLINDER BARREL

Wilfred S. Bobier, 4518 Brightmore, Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 60,333, Aug. 30, 1970, Pat. No. 3,739,691. This application Jan. 22, 1973, Ser. No. 325,128

Int. Cl. F01b *13/04*

U.S. Cl. 91—487 5 Claims

1. A fluid pressure energy translating device of the axial piston type comprising:

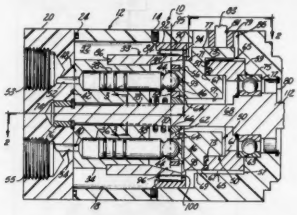
a housing having a longitudinal bore with a stationary valve plate at one end thereof;

a drive shaft rotatably carried within said housing bore, said drive shaft having a male spline;

a rotatable cylinder barrel mounted on said drive shaft and having one end in abutment with said valve plate, said cylinder barrel having a plurality of arcuately spaced cylinder bores, said cylinder barrel having a female spline mating with said drive shaft male spline to form a driving connection thereinbetween;

a bearing means having an inner race carried by the outer peripheral surface of said cylinder barrel, said bearing means having an outer race carried by the wall of said housing longitudinal bore such that said bearing means providing radial support for said cylinder barrel;

said male and female splines having complementary configurations for permitting self-centering alignment between said cylinder barrel and said drive shaft such that said cylinder barrel will float on said valve plate and said cylinder barrel will be centered with respect to said bearing means, said female spline having a pitch diameter which is greater than the pitch diameter of said male



spline such that there is an enlarged radial clearance space between said splines;

a plurality of pistons with inner ends disposed for reciprocal stroking movement within said cylinder bores; and

an inclined thrust plate mounted in said housing in a driving relation with the other ends of said pistons for imparting a reciprocal stroking movement to said pistons within said cylinder barrel bores as said cylinder barrel rotates whereby the radially directed forces exerted on said cylinder barrel are not transferred to said drive shaft.

3,890,883

FLOW CONTROL ARRANGEMENT FOR AN AXIAL PISTON PUMP

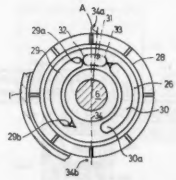
Werner Rometsch, Gerlingen; Walter Robeller, Boblingen; Gerhard Lutz, Faurndau; Eckehart Reichel, Aschaffenburg-Schweinheim; Paul Bosch, Ludwigsburg, and Gerd Vohringer, Schwieberdingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 15, 1973, Ser. No. 332,749

Claims priority, application Germany, Feb. 25, 1972, 2208890

Int. Cl. F04b *13/04*

U.S. Cl. 91—499 10 Claims



1. Flow control arrangement for an axial piston pump, comprising cylinder body means having an axis, cylinders arranged in a circle about said axis, and pistons in said cylinders; housing means including a swash plate engaged by said pistons, one of said means being rotatable relative to the other means about said axis so that each piston is axially advanced and retracted by said swash plate between advanced and retracted dead center positions located in an axial plane; said cylinder body means having a first control face formed with a circular row of cylinder ports communicating with said cylinders, respectively, and said housing means having a second control face formed with a part-circular continuous inlet port and a part-circular continuous outlet port, respectively located on opposite sides of said plane, said inlet and said outlet

port being the only ports formed in said second control face, said first and said second control faces cooperating during rotation so that said inlet and outlet ports are swept by said cylinder ports, said inlet port being longer than said outlet port and having one end located closer to said plane in the region of said retracted dead center position than half of the circumferential extension of each cylinder port so that each cylinder port communicates with said one end of said inlet port also after the respective piston has passed through said retracted dead center position and begins to move towards said advanced dead center position whereby the respective cylinder is completely filled while the center of the respective cylinder port moves a predetermined angle beyond said plane.

3,890,884

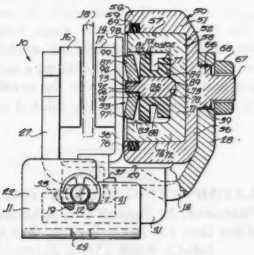
HYDRAULIC ACTUATOR

Russell E. Silberschlag, Glen Ellyn, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 23, 1973, Ser. No. 418,534

Int. Cl. F16j 1/10; F16d 65/32

U.S. Cl. 92—84 **3 Claims**



1. An hydraulic actuator comprising a housing member including a substantially cylindrical chamber opening outwardly through a wall thereof and a generally cup shaped piston slidably received within said chamber and adapted to move outwardly in response to fluid pressure in said chamber, said piston including head and skirt wall portions defining a central cavity opening outwardly of said actuator, said head portion including a seat in said cavity remote from the open end thereof, and

a thrust assembly extending into said central cavity having an annular foot disposed outwardly of said piston, a strut having a head portion engageable with said seat extending through said central cavity between said annular foot and said piston head wall, and a resilient collar embracing said strut adjacent said annular foot having intersecting planar surfaces thereon defining a peripheral sharp edge frictionally engaging said skirt portion of said piston, said resilient collar being an elastomeric sleeve including a pair of spaced annular portions, one of said annular portions defining said sharp peripheral edge engaging said piston skirt adjacent said annular foot, and the other of said annular portions having a face abutting said piston head wall portion outwardly of said seat, said collar peripheral edge yieldably urging said strut toward a centered position with respect to said piston skirt permitting displacement of said strut from said centered position under load while substantially isolating said piston skirt from lateral forces imposed on said thrust assembly under load.

3,890,885

ACTUATORS

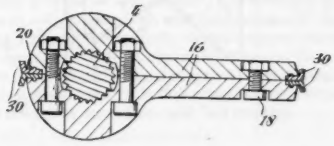
Alan Richard Brine Nash, 39 Abbott's Ride, Farnham, England

Filed July 18, 1973, Ser. No. 380,204

Claims priority, application United Kingdom, July 21, 1972, 34366/72

Int. Cl. F01c 9/00

U.S. Cl. 92—125 **11 Claims**



1. A rotary actuator having a piston comprising a pair of similar opposed portions secured together to form a substantially planar vane-like member and peripheral sealing means extending around said member, a plane of jointing between said opposed piston portions being substantially coincident with a main central plane of the piston, a tubular recess being formed between said piston portions at one region of the piston, a shaft comprising bearing portions for mounting the piston in a rotary member extending into said tubular recess, and splines being provided on the shaft and on said opposed piston portions for interengagement to prevent rotation between the shaft and the piston portions, the shaft splines being formed by radially outwardly facing surfaces and the piston portion splines being formed by radially inwardly facing portions complementary to the shaft spline surfaces in engagement therewith, the splines on the two piston portions being confined to peripheral regions of the tubular recess remote from the plane of jointing.

3,890,886

APPARATUS FOR INTERLEAVING SHEETS OF PAPER BETWEEN INDIVIDUAL SLICES OF CHEESE FOR PACKAGES OF SLICED CHEESE

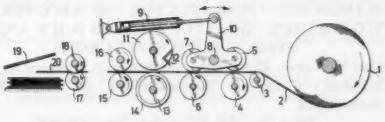
Andreas Fessler, and Ewald Fessler, both of Heimenkirch, Allgau, Germany, assignors to Hochland, Reich, Summer & Co., Heimenkirch/Allgau, Germany

Filed Oct. 23, 1973, Ser. No. 408,519

Claims priority, application Germany, Oct. 26, 1972, 2252605

Int. Cl. B65b 41/10

U.S. Cl. 93—93 D **10 Claims**

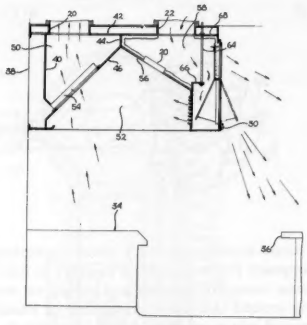


1. An apparatus for interleaving sheets of paper between individual slices of cheese for packages of sliced cheese comprising a pair of feeding rollers which feed a paper web from a roll of paper, a perforating cutter roller downstream of said feeding rollers which rotates continuously and at a faster peripheral speed than said feeding rollers and cooperates with a backing roller to separate a paper sheet of desired length from the leading web end, and a pair of rollers following said cutter roller to position said paper sheet without subsequent support underneath a falling cheese slice.

3,890,887
EXHAUST HOOD

Arnold S. Kaufman, Studio City, and Albert Sweet, Northridge, both of Calif., assignors to Elsters, Inc., Hollywood, Calif.

Filed Jan. 16, 1974, Ser. No. 433,727
Int. Cl. F23j *11/00*
U.S. Cl. 98—115 K **4 Claims**



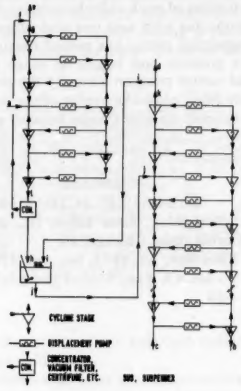
1. An Exhaust Hood comprising:
a. means for defining an exhaust plenum for collecting fumes and vapors and delivering them to an exhaust outlet;
b. means defining a front plenum for coupling to a source of air;
c. means for directing air from said front plenum in a predetermined direction for passage at least in part along a flow path leading toward said exhaust plenum; and
d. a ventilation door on the front of said Exhaust Hood and in communication with said plenum, said ventilation door being movable from a closed position to an open position to direct air from said plenum generally outward and downward from said Exhaust Hood, said ventilation door being rotatable about a horizontal axis between said closed position and said open position, and having an upper portion above said horizontal axis and a lower portion below said horizontal axis, the front of said upper portion of said door above said axis and the rear of the lower portion of said door below said axis engaging cooperatively disposed members on said plenum when said door is closed, said door being movable to said open position by movement of said lower portion of said door outward whereby air from the plenum may flow outward over the top of said door and between the lower portion of said door and the front of said Exhaust Hood.

3,890,888
METHOD AND APPARATUS FOR THE RECOVERY OF NON-DILUTED OR LITTLE DILUTED JUICE AND OF STARCH FROM ROOT CROPS

Petrus Verberne, Hoogezand, Netherlands, assignor to W. A. Scholten's Chemische Fabrieken B.V. of W. A., Foxhol, Netherlands

Filed Dec. 22, 1972, Ser. No. 317,682
Claims priority, application Netherlands, Jan. 5, 1972, 7200127
Int. Cl. A23l *1/12*
U.S. Cl. 99—483 **12 Claims**

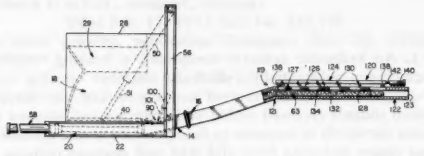
1. A method of recovering starch and slightly diluted juice from root crops, comprising the steps of grating tubers, without the addition of water, to a pulp in which the fibers are predominantly larger than 0.2 mm but not larger than 1 mm, feeding the pulp into at least the 4th hydrocyclone stage of a countercurrent hydrocyclone system containing at least 13 hydrocyclone stages each having a supply pump which is independent of counterpressure connected thereto, all hydrocyclone stages other than the first and final having the discharge conduit connected to the supply pump of the next succeeding stage and the overflow conduit connected to the supply pump of the next preceding stage, feeding countercurrently into the final hydrocyclone stage fresh water in an amount of up to 0.8 m^3 per metric ton of tubers, and withdrawing from the final hydrocyclone stage a substantially pure starch fraction and withdrawing from the overflow of the first stage a fraction consisting of slightly diluted juice containing fibers.



3,890,889
MATERIAL COMPACTING AND DISPOSAL APPARATUS

Francis B. Fishburne, 24 Summit Dr., Asheville, N.C. 28704

Filed Dec. 13, 1972, Ser. No. 314,601
Int. Cl. B30b *15/16, 15/30*
U.S. Cl. 100—48 **11 Claims**



1. In a material compacting and disposal apparatus, the combination of:
a press unit comprising
rigid means defining an elongated compression chamber having a uniform transverse cross-section throughout its length and an elongated lateral opening via which material can be supplied to the chamber,
a press platen having a shape conforming to the cross-sectional shape of said compression chamber,
first power means connected to said press platen to drive the same through said chamber,
confining wall means positioned adjacent said lateral opening to define a rigid precompression chamber having a cross-sectional shape conforming to said lateral opening, a gate having a plane shape conforming to the shape of said lateral opening and mounted for movement between an initial retracted position, in which uncompacted material can be supplied to said chambers, and an actuated position, in which said gate fills said lateral opening and completes said compression chamber, and
said power means connected to said gate and operative to force the same from said initial position through said

precompression chamber to said actuated position to compress said material;

an extrusion housing forming a continuation of said compression chamber at the end thereof toward which said press platen is driven by said first power means, said extrusion housing comprising

a fixed wall conduit with a lateral opening extending lengthwise thereof and across the entire width thereof,

a rigid extrusion gate of plane shape conforming to and extending completely across said lateral opening of said conduit, said extrusion gate being mounted for pivotal movement about a transverse axis located adjacent said conduit, and

yieldable means connected to said extrusion gate and operative to yieldably maintain the same in a position within said conduit, the space between said extrusion gate and said conduit defining a tapering extrusion throat having a maximum cross-section smaller than said compression chamber cross-section; and

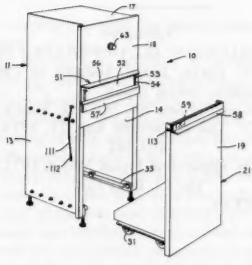
elongated conduit means connected to said extrusion housing for conducting compressed material away therefrom.

3,890,890

WASTE COMPACTOR WITH CLAMSHELL BAG SUPPORT

Ransom J. Hennells, Plymouth Townshhip, Wayne County, Mich., assignor to Compactor Company, Inc., Belleville, Mich.

Filed Mar. 20, 1973, Ser. No. 342,979
Int. Cl. B30b *15/18*
U.S. Cl. 100—48 **16 Claims**



1. A waste compactor for permitting the depositing and compacting of waste within a container, comprising:

housing means;

extendible ram means mounted on said housing means adjacent the upper end thereof, said ram means being vertically extendible downwardly for permitting compacting of waste;

removable cart means coacting with the lower end of said housing means and including a substantially horizontal wall means positionable directly beneath said ram assembly when said cart means is in a first position permitting compacting of waste, said cart means being movable outwardly relative to said housing means to a second position wherein said cart means is laterally spaced from said ram means, said cart means when in said second position permitting a container to be mounted thereon or released therefrom; and

guide means coacting between said housing means and said cart means for guiding the movement of said cart means toward and away from said first position, said guide means including a pair of substantially parallel, horizontally elongated guide rails fixedly secured to the opposite sides of said housing means adjacent the lower end thereof, said guide rails each including upper and lower guide surfaces;

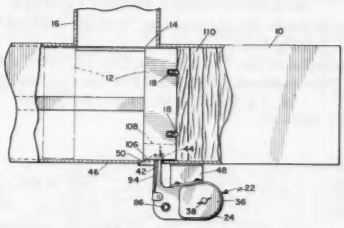
said guide means further including a pair of elongated, substantially L-shaped guide flanges fixedly secured to and projecting downwardly from the horizontal wall means of said cart means, said guide flanges being disposed adjacent and extending longitudinally along the opposite sides of said horizontal wall means, each said L-shaped guide flange including a substantially vertical leg which has its upper end fixedly secured to said horizontal wall means and a substantially horizontal leg fixedly secured adjacent the lower end of said vertical leg, said horizontal legs of said pair of guide flanges projecting outwardly away from one another, said L-shaped guide flanges in cooperation with said horizontal wall means defining a pair of substantially channel-shaped elements which open outwardly in opposite directions from one another, said channel-shaped elements being disposed to partially surround the guide rails when said cart means is moved toward or away from said first position.

3,890,891

TAGGING ATTACHMENT FOR HAY BALER

Don D. Floyd, 359 J St., and Lee M. Whittle, 598 W. Fredrick Rd., both of Brawley, Calif. 92227

Filed Aug. 9, 1974, Ser. No. 496,063
Int. Cl. B30b *15/00*
U.S. Cl. 100—102 **10 Claims**



1. A tagging attachment for a hay baler having a baling chamber with hay inlet, a reciprocating plunger for compacting hay in successive layers in the chamber to form a bale, holding means for holding compacted layers of hay in the chamber between strokes of the plunger, and control means for controlling the length of a bale, the tagging attachment comprising:

a casing having means for holding a roll of tags therein;

a hollow arm extending from said casing and having an end nozzle thereon;

mounting means for holding the casing on the hay baler with said nozzle projecting into the baling chamber;

feed means in said casings for feeding tags from the roll and through said arm, to extend one at a time from said nozzle;

a knife mounted on said arm for cutting off the extended tag;

and timing means for timing the knife action to cut off the tag between predetermined layers of the hay bale.

3,890,892

ULTRASONIC MARKING

Guenter H. Loose; William J. Diesel, and Thadeus S. Graczyk, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

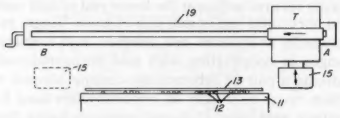
Continuation of Ser. No. 85,595, Oct. 30, 1970, abandoned. This application Nov. 9, 1972, Ser. No. 305,050
Int. Cl. B44c *1/24*
U.S. Cl. 101—32 **2 Claims**

1. A method for embossing indicia into a thin sheet of malleable thermoplastic material which comprises:

providing an anvil having an indicia defined thereon by a plurality of individual spaced dot-like protuberances projecting from the surface of said anvil;

positioning a thermoplastic material over the anvil with one side of said material resting upon and in engagement with the dot-like protuberances; and

applying ultrasonically vibrating pressure impulses generated by an ultrasonic vibrating device comprising a transducer and horn to the opposite side of said thermoplastic material for applying heat and pressure to said material causing said material in register with and resting on the protuberances to melt, be displaced and to resolidify forming a plurality of clear, undistorted, indentations extending partially through said material and which due to the reduced thickness at said indentations are substantially transparent and clearly visible in the presence of a weak light.



3,890,893

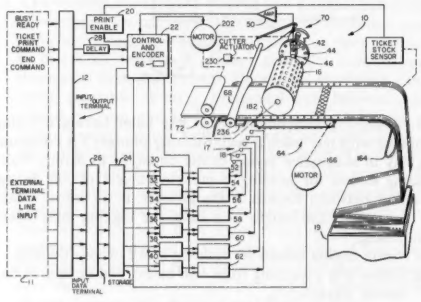
MULTIPLE SHEET TICKET PRINTER

Robert D. Kodis, Brookline, Mass., assignor to Di/An Controls, Inc., Boston, Mass.

Continuation of Ser. No. 300,144, Oct. 24, 1972, abandoned. This application May 13, 1974, Ser. No. 469,354

Int. Cl. B41f *13/58, 13/60;* **B41j** *9/10*

U.S. Cl. 101—69 **3 Claims**



1. A high speed rotary printer for printing selected symbols on an endless web of multiple sheet stock formed with sprocket holes disposed in spaced parallel relationship with the longitudinal axis thereof, said printer comprising:

a. a rotatable printing cylinder having rows of raised characters disposed about its periphery in arcuate columns;

b. an impactor assembly including a plurality of actuators, impactors and hammers, one of each said actuator associated with one of each said impactors, one of each said impactors associated with one of each said hammers, one of each said hammer associated with one of each said rows of raised characters, each said actuator having energized and deenergized states, each said impactor operative between a rest position and an actuated position, each said hammer restrained for reciprocal movement between a rest position and a strike position, said impactor moved from its rest position to its actuated position when said actuator associated therewith is momentarily in its energized state, said moved impactor momentarily engaging said hammer associated therewith, said engaged hammer moving from its rest position to its strike position and decoupling from said moved impactor, said moved impactor returning to its rest position, said engaged hammer striking the multiple sheet stock and momentarily forcing the multiple sheet stock against one of said raised symbols in said row in registration with said engaged hammer, said hammer returning to its rest position, said raised symbol pressed against the multiple sheet stock being printed on each of the multiple sheets;

c. first sprocket drive means;

d. second sprocket drive means;

e. a belt engaging said first and second sprocket drive means, said belt including sprocket pins adapted for engagement with the sprocket holes in the multiple sheet stock, the multiple sheet stock forwardly advancing in a path from said first sprocket drive means to said second sprocket drive means when engaged by said belt;

f. a rotating cutting blade operatively connected to said second sprocket drive means, said rotating cutting blade operative to sever the sprocket holes from the multiple sheet stock;

g. rotary cutter means positioned in said path after said second sprocket drive means, said rotatable printing cylinder disposed in said path between said first sprocket drive means and said rotary cutter means, said rotary cutter means disposed in perpendicular relationship to the longitudinal axis of the multiple sheet stock and operative to sever the multiple sheet stock after said symbols are printed thereon; and

h. tension means engaging opposite faces of the multiple sheet stock, said tension means disposed in said path after said rotary cutter means, said tension means providing tension on the multiple sheet stock and ejecting the printed multiple sheet stock from the printer when severed by said rotary cutter means.

3,890,894

ELECTROMAGNETICALLY-OPERATED PRINTER

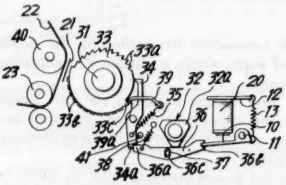
Shohachi Nihira, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 356,472, May 2, 1973, Pat. No. 3,848,527. This application Aug. 15, 1974, Ser. No. 497,562

Claims priority, application Japan, May 4, 1972, 47-44378

Int. Cl. B41j *5/00*

U.S. Cl. 101—93.18 **1 Claim**



1. An electromagnetically-operated printer for printing on paper comprising a type wheel which comprises a plurality of column wheels frictionally mounted on a shaft in groups, each column wheel having types, hooks and a projection operative as a reset edge, means for printing the types on the paper, stopping means for engaging with said projections of all of the column wheels, said types being so arranged that when all column wheels are stopped by said stopping means, the wheels in each group are positioned in different phases, a select pawl provided for each column wheel and adapted to engage with said hooks of each column wheel, type selecting means for selecting a given type for each of the column wheels of said type wheel, column selecting means for each group of wheels rotating at a predetermined ratio relative to the shaft of said type wheel, said column selecting means being functionally

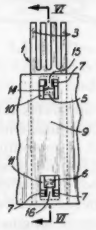
coupled to said type selecting means, and electromagnetic means each corresponding to said column selecting means and functionally coupled to said type selecting means, said electromagnetic means being controlled by an electrical control means for comparing a given type with the type position of said type wheel, and said type selecting means being actuated only when both said column selecting means and said electromagnetic means are simultaneously actuated.

3,890,895

ENDLESS TYPE-CARRYING TAPE FOR PRINTING MACHINE

Jacques Roland Deproux, Sevres, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Nov. 12, 1973, Ser. No. 414,998
Int. Cl. B41i *1/20*
U.S. Cl. 101—111 **9 Claims**



1. A type-carrying assembly for impact printers, comprising in combination:

an endless, flexible tape adapted to be supported by the type-carrying drive of an impact printer; and

a series of type-bearing members secured to said tape along the length thereof, each such member comprising an elongate strip of stiff, resilient material presenting a base portion disposed in face-to-face relation with said tape to extend transversely thereof and a free end portion projecting laterally of the tape, said free end portion providing a series of flexible and resilient type-bearing fingers joining said base portion near that edge of the tape from which said free end portion projects and extending therefrom essentially perpendicular to the length of the tape, said fingers being separated from each other, said tape being provided with transversely spaced openings for each member, and the base portion of each member being provided with locking tab means consisting of a pair of oppositely directed and outwardly offset tangs adapted to fit through said openings when the member is sprung into bowed shape and to lock with the tape when released from such bowed shape.

3,890,896

TEXTILE-PRINTING MACHINE

Peter Zimmer, Untere Sparchen 54, A 6330 Kufstein, Austria

Filed Jan. 3, 1973, Ser. No. 320,739
Claims priority, application Austria, Jan. 4, 1972, 3172/72; Feb. 24, 1972, 001531/72
Int. Cl. B41f *15/40, 15/44*
U.S. Cl. 101—119 **6 Claims**

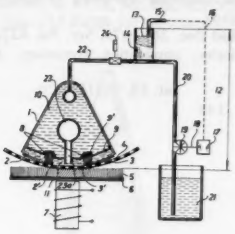
1. In a textile-printing machine, in combination:

a downwardly open receptacle for coloring fluid;

a pair of elastic sealing strips extending across part of the open bottom of said receptacle and forming a discharge slot therebetween, said strips sloping downwardly toward said slot and being provided with upturned confronting edge bounding said slot;

an apertured masking screen underneath said receptacle bridging said slot; and

loading means within said receptacle bearing on said strips adjacent said upturned edges for holding the lowest parts



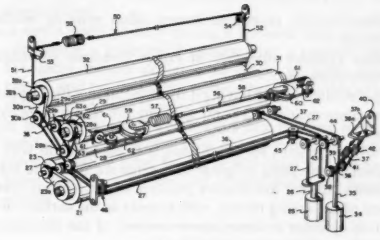
of said strips in firm contact with said screen against an underlying substrate to be colored, thereby preventing said coloring fluid from penetrating between said mask and said strips.

3,890,897

OFFSET ROTARY PRINTING PRESS WITH CABLE ACTUATED FORM ROLLERS

Chris A. Christoff, Lancaster, Calif., assignor to Stevens Corporation, Fort Worth, Tex.

Division of Ser. No. 55,016, July 15, 1970, Pat. No. 3,774,537.
This application Aug. 2, 1972, Ser. No. 277,825
Int. Cl. B41f *31/36*
U.S. Cl. 101—148 **4 Claims**



1. A rotary printing press having a plate cylinder and form rollers for contact with the plate cylinder comprising a cable actuated system for moving at least two form rollers simultaneously toward a plate cylinder; said system including:

a. a first motor in a fixed position;

b. at least two cables connected to and drawn by said first motor;

c. said form rollers being pivotally attached about some predetermined axis other than their own;

d. each form roller having two end members with each end defining a sheave for receiving said cables;

e. said cables being connected to the form rollers by looping one cable about the sheave at one end of each form roller, looping the other cable about the sheave at the other end of each form roller, and securing each cable to a fixed point such that drawing of said cables will cause the form rollers to move simultaneously toward plate cylinder; and

f. a spring loaded cable actuation system separate from said first motor and said two cables and acting opposite thereto for moving the form rollers away from the plate cylinder upon deactuation of said first motor and for maintaining the form rollers at a predetermined distance from the plate cylinder until actuation of said first motor.

3,890,898

DIRECTIONALLY REVERSIBLE ROTARY OFFSET PRINTING MACHINE AND WETTING SYSTEM THEREFOR

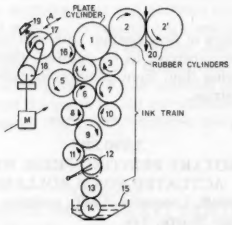
Hermann Fischer, Augsbury, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Germany

Filed Dec. 26, 1973, Ser. No. 427,788

Claims priority, application Germany, Jan. 16, 1973, 2301879

Int. Cl.[2] B41F 7/26

U.S. Cl. 101—148 8 Claims



1. Directionally reversible rotary offset printing machine comprising

a plate cylinder operable in either direction of rotation when printing;

inking means (3–15) having a fixed location with respect to the plate cylinder (1) and applying ink to the plate cylinder;

a wetting system (16–19) having a fixed location with respect to the plate cylinder (1), separate from the inking means, so that the relative position of the wetting system and of the inking means, with respect to the surface of the plate cylinder reverses upon reversal of the direction of rotation of the plate cylinder (1);

wherein the wetting system comprises

at least two rollers, one of the rollers (17) being axially shiftable and forming a rubbing cylinder and having a surface capable of being coated by ink,

the other roller (16) forming a wetting liquid transfer roller having a rubberized surface and being located in frictional, rotation-transmitting engagement with the rubbing cylinder (17) and further engaging the plate cylinder (1), the circumferential speed of said wetting transfer roller (16) being controlled by its engagement with the rubbing cylinder (17) and differing from the circumferential speed of the plate cylinder (1);

means (M) positively driving the shaft of the rubbing cylinder (17) so that the surface of the rubbing cylinder (17) will be rotating at a circumferential speed differing from the surface of the circumferential speed of the plate cylinder, as well as being axially reciprocating;

and means (19) applying a wetting liquid to the surface of the rubbing cylinder (17) so that a fine film of wetting liquid will form over ink deposited on the surface of the rubbing cylinder by transfer from the plate cylinder (1) over the transfer roller (16), for application of said wetting liquid to the plate cylinder by the transfer roller (16) when driven by engagement of its ink-and-wetting liquid coated surface with the ink-and-wetting liquid coated surface of the rubbing cylinder (17).

3,890,899

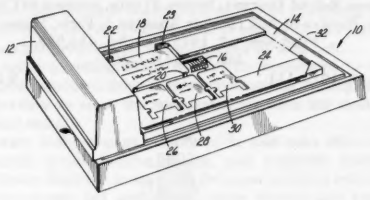
CARD GAGE FOR DATA RECORDER

Walter James Brugge, Highland Heights, and Edward Francis Takacs, Willoughby, both of Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Feb. 25, 1974, Ser. No. 445,799

Int. Cl. B41f 27/04

U.S. Cl. 101—269 13 Claims



1. In a data recorder apparatus for imprinting data from a plurality of generally rectangular embossed information cards disposed on a rigid bed, a mounting for holding the cards securely in place during imprint, said mounting comprising:

an elongated main body of generally planar configuration mounted to the data recorder bed,

a plurality of gage fingers longitudinally spaced along the length of said main body and integral therewith, each of said fingers extending laterally outward from said main body and generally disposed in the plane thereof, each of said fingers including a pair of oppositely facing surfaces generally perpendicular to the recorder bed and defining side gages, the side gages on adjacent fingers being spaced apart a distance approximately equal to the width of a card for engagement with the side edges of the card, a plurality of elongated wall surfaces longitudinally spaced along the length of said main body, each being perpendicular to said side gages and the data recorder bed and defining a bottom gage adapted to engage the bottom edge of a card,

each of said fingers includes a distal end portion spaced from said main body, each distal end portion including a pair of protrusions extending in opposite directions laterally from said side gages of the associated finger, said protrusions defining retaining gage surfaces which cooperate with notches in the side edges of the cards to prevent their movement away from said bottom gage, and

a plurality of tab portions integral with said main body, each of said tab portions extending laterally outward from said main body in the same general direction as said fingers and overhanging one of said bottom gages to retain the bottom edge of an inserted card, said protrusions being spaced from said main body by a distance greater than the distance said tab portions extend outwardly from said main body, whereby the bottom edge of a card may be inserted under said tab portion and the notches brought down over said protrusions when mounting the card.

3,890,900

ELECTRICAL SAFING AND ARMING CIRCUIT

William I. Gould, Jr., Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

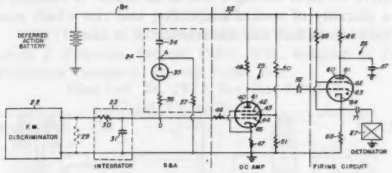
Filed Oct. 5, 1960, Ser. No. 60,755

Int. Cl. F42c 15/40

U.S. Cl. 102—70.2 R 4 Claims

1. A safing and arming circuit for blocking transients in an electronic fuze caused by the rising voltage of a deferred-

action battery, comprising: an amplifier having a plate electrode connected to said battery, a control grid, an input terminal, and a resistor connecting said grid to said terminal; and an inhibiting circuit having a capacitor, a gaseous discharge



voltage regulator tube, and a current limiting resistor connected serially between said battery and said input terminal for producing an inhibiting voltage at said terminal only during the rise time of said rising voltage.

3,890,901

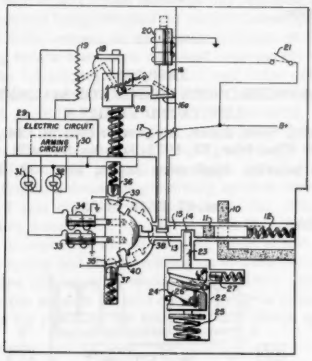
DIGITAL ELECTRONIC SAFETY AND ARMING SYSTEM

Matthew E. Anderson, Ontario, and Stephen L. Redmond, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 255,746, May 22, 1972, Pat. No. 3,793,890. This application Oct. 29, 1973, Ser. No. 410,922

Int. Cl.[2] F42C *9/00, 11/00, 15/40*

U.S. Cl. 102—70.2 R **10 Claims**



1. A digital electronic safety and arming system for an explosive missile comprising:

an arming path operative upon actuation for detonating said missile;

means for causing a discontinuity in said arming path;

a first interlock engaged with said means for maintaining said discontinuity;

a safety release responsive upon actuation for disengaging said first interlock;

a second interlock engaged with said means and being responsive to a predetermined minimum acceleration for disengagement;

means for producing a digital output signal representative of distance in response to an acceleration signal developed during a determinable fixed time period;

comparator means for comparing said output signal with a digital reference signal representative of a minimum safe distance, and producing an arming signal when the compared signals are equal; and

arming means responsive to said arming signal for eliminating said discontinuity thereby arming said missile.

3,890,902

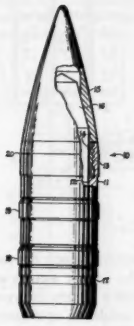
PROJECTILE

Bruce W. Travor, Holland, Pa., and Samuel L. Brown, Willingboro, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 4, 1973, Ser. No. 421,570

Int. Cl.[2] F42B *13/16, 13/06*

U.S. Cl. 102—93 **3 Claims**



1. In an aerodynamically stable projectile having a heavy penetrator positioned within a non-discarding sabot,

said non-discarding sabot including a sabot body portion and an aerodynamic windshield nose member threadedly secured thereto,

said heavy penetrator secured within said sabot body portion and said nose member,

said nose member having a forward tapered external surface, said nose tapered surface terminating in a closed forward end,

said sabot body portion having a forward exterior surface containing a cylindrical portion and a tapered portion forwardly thereof defining an origin of ogive therebetween, said tapered sabot portion being a mating continuation of said nose tapered surface,

said sabot body portion carrying a first rotating band rearward of the center of gravity of said projectile, and

a second rotating band having a mid-point located on said sabot body portion forward of said projectile center of gravity.

3,890,903

STORAGE ASSEMBLIES

Richard G. D. Showell, Bishampton, near Pershore, England, assignor to Bar Productions (Bromsgrove) Limited, Bomsgrove, England

Filed Nov. 30, 1973, Ser. No. 420,694

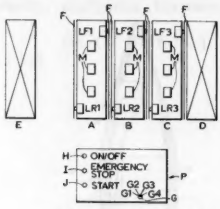
Claims priority, application United Kingdom, Aug. 4, 1973, 37102/73

Int. Cl. A47b *53/00*

U.S. Cl. 104—1 R **14 Claims**

1. A storage assembly comprising a row of storage members which are movable along the length of the row in either of two opposite directions so that a gangway can be provided between any two neighbouring storage members; drive means associated with each storage member which serves to move it along the length of the row; two drive switch means associated with each storage member which each control the drive means associated with said storage member and operate to cause the latter to be driven in a different direction along the length of the row; separate elongate feeler bars mounted on both sides of each storage member towards the bottom thereof so that each extend substantially the full width of the storage member and is operated by the neighbouring storage member opposite when said storage member on which it is mounted has closed onto said neighbouring storage member; two sensor switches

mounted on each storage member which are each operated by a respective one of said feeler bars when the latter is operated; a central programmer including a plurality of selector switches and manually operable means which control operation of the selector switches in a predetermined manner for selection of the different gangways; and a plurality of control circuits each of which includes a selector switch, a sensor switch and one



of said drive switch means which is associated with the same storage member as the sensor switch and which operates to cause the associated drive means to drive said storage member in a direction which results in operation of the sensor switch through the associated feeler bar, said drive switch means being operative only when the selector switch is operated and the sensor switch is not operated.

3,890,904

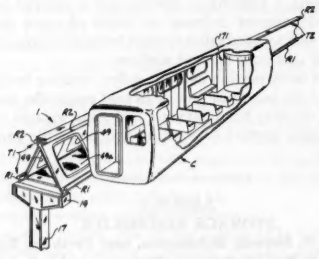
RAILWAY SYSTEM

Lawrence K. Edwards, 565 Arastradero Rd., Palo Alto, Calif. 94306

Filed Oct. 1, 1973, Ser. No. 402,299

Int. Cl. E01b *25/08*

U.S. Cl. 104—121 **25 Claims**



2. A railway system as set forth in claim 1 wherein the car supporting and guiding means comprises inclined wheels that engage the head of the lower rail, one wheel ahead of the center of the car and one wheel behind the center of the car, said lower rail and wheels being in a plane inclined to the vertical oppositely from the inclined plane of the rail heads.

3,890,905

APPARATUS FOR DRIVING A DEVICE WITHIN A PIPE

Edward A. Clavin, Houston, Tex., assignor to CRC-Crose International, Inc., Houston, Tex.

Filed Feb. 1, 1974, Ser. No. 438,645

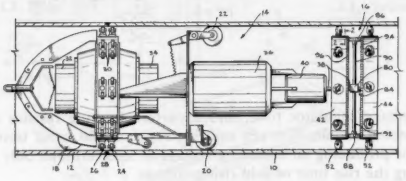
Int. Cl.[2] B61B *13/10;* **B23B** *31/40;* **B08B** *9/04*

U.S. Cl. 104—138 G **13 Claims**

1. An apparatus for driving a device within a pipe comprising:

a. a first drive member, said first drive member having its axis coincidental with the axis of said pipe, said first drive member having a first rim thereon, said first drive member having a hub at its center of rotation and a plurality of spokes supporting said rim which extend between said hub and the interior of said rim;

b. a second drive member, said second drive member having its axis coincidental with the axis of said pipe, said second drive member having a second rim thereon, said second drive member having a hub at its center of rotation and a plurality of spokes supporting said rim which extend between its hub and the interior of its rim;



c. a plurality of wheels;

d. means for mounting said plurality of wheels on the rims of said first and second drive members, said wheels extending outwardly from said first and second rims to engage the interior of said pipe; and

e. means for rotating each of said first and second drive members in opposite directions about their axes whereby engagement of said wheels against the interior of said pipe develops a driving force to move the device through the pipe.

3,890,906

LINEAR SYNCHRONOUS MOTOR FOR MAGNETICALLY LEVITATED VEHICLE

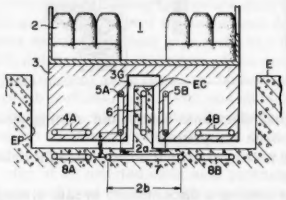
Naoki Maki, Naka, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 27, 1973, Ser. No. 345,475

Claims priority, application Japan, Mar. 28, 1972, 47-31005

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 SS **11 Claims**



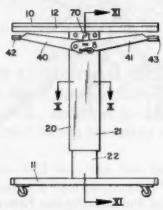
1. In a magnetically levitated vehicle which includes a linear synchronous motor having field coils on the vehicle for generating a constant magnetic field and driving coils disposed on the ground and opposite to the path of said field coils, the improvement wherein the ratio of the width of said driving coils to the width of said field coils is chosen so as to fall in the range expressed by the following formula, where $2a$ is the width of said field coils, $2b$ is the width of said driving coils, and g is the average distance between the paths of said field coils and said driving coils in the normal running of the vehicle:

$$1+\frac{g}{2a} \leqq \frac{b}{a} \leqq 1+\frac{g}{a}+\sqrt{\frac{2g}{a}}$$

3,890,907
VERTICALLY ADJUSTABLE OVERBED TABLE

Warren J. Peterson, Stevens Point, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed Oct. 24, 1973, Ser. No. 409,360
Int. Cl. A47b *9/02*
U.S. Cl. 108—136 **14 Claims**



1. A vertically adjustable overbed table comprising:

a pedestal, a horizontal table top mounted at the top of said pedestal and a base platform at the lower end of said pedestal;

said pedestal including an outer column and an inner column, said outer column telescopically engaging said inner column and being adapted for vertical telescoping movement with respect to said inner column; at least one spring means associated with said columns for maintaining the telescoping movement of said outer column and said inner column in approximate equilibrium; and a clutch assembly mounted within said pedestal;

said clutch assembly including a rotatable clutch drum, means for rotating said drum during telescopic movement of said columns, a tensioned clutch spring means surrounding said drum for permitting upward movement of one of said columns with respect to the other of said columns when an upward force is exerted thereon sufficient to overcome the equilibrium effect of said constant force spring and for permitting downward movement of said one column with respect to said other column only when the tension of said clutch spring is released; and means for releasing the tension of said clutch spring.

3,890,908
METHOD AND APPARATUS FOR PYROLYTICALLY REDUCING WASTE

Jurgen von Klenck, Dusseldorf; Erich Michel, Essen, and Klaus-Dieter Gerstenacker, Dusseldorf, all of Germany, assignors to Mannesmann-AG, Dusseldorf, Germany

Filed Jan. 25, 1974, Ser. No. 436,484
Claims priority, application Germany, Jan. 26, 1973, 2304369
Int. Cl. F23g *7/00*
U.S. Cl. 110—8 R **39 Claims**

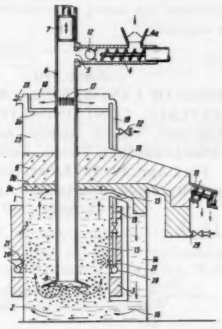
1. Method of pyrolytically reducing waste products under exclusion of air comprising the steps of:

feeding the waste products to and deep into a bath of molten material for discharge into the bath well below the top thereof, the waste being composed predominantly of components other than the material, the molten material having elevated temperature sufficient to sustain pyrolytic reduction of waste and under conditions causing the waste products to drift freely upwardly in the molten material thereby pyrolytically decomposing and reducing the waste product, through continuing heat transfer from the molten material to the waste product under direct contact therewith; and

extracting the products as resulting from the pyrolytic reduction from above the surface of the bath including continuous discharge of gas developing upon waste decompositioning.

23. Apparatus for pyrolytically reducing waste products comprising:

first means constructed for exclusion of air, for holding a bath of molten material at elevated temperatures sufficient to sustain reduction of waste;



second means projecting into the first means for feeding the waste products to and discharging them deep into a bath of molten material when in the first means through discharge opening well below the surface of the bath and under conditions causing the waste products to drift freely in upward direction in the molten material thereby pyrolytically reducing the waste products through continuing heat transfer from the molten material to the waste product under direct contact therewith;

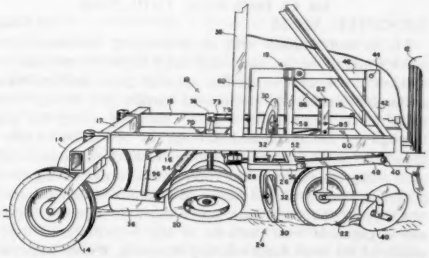
third means, external to the interior of the first means for continuously heating the bath; and

means for extracting the products as resulting from the pyrolytic reduction from above the surface of the bath.

3,890,909
DEVICE FOR ALIGNING, CUTTING AND COVERING SEED CANE

Vernie A. Boots, Belle Glade, Fla., assignor to A. Duda & Sons, Inc., Oviedo, Fla.

Filed Mar. 8, 1973, Ser. No. 339,279
Int. Cl. A01c *1/00*
U.S. Cl. 111—1 **16 Claims**



1. A seed cane cutting device comprising a wheeled main frame that can be caused to move through a field, a floating frame pivotally connected to said main frame, said floating

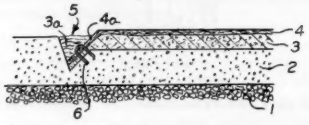
frame supporting a rotary type cutter assembly, said cutter assembly being disposed in a position to cut seed cane lying on the ground during its rotation, with the plane in which said cutter assembly is operative being substantially perpendicular to the path of travel of the prime mover, means for driving said cutter assembly in rotation in a pre-established relationship to the speed of travel of the prime mover over the ground, such that the faster the prime mover travels, the faster said cutter assembly is caused to rotate, said floating frame utilized for carrying said rotating cutter assembly having a wheel operatively disposed on its underside aft of said cutter and operatively associated therewith, said wheel serving not only to support a substantial portion of the weight of said floating frame, but also able to hold substantially stationary during the cutting operation, the canes encountered and acted upon by said cutter assembly.

3,890,910

METHOD OF LAYING WEBS OF COMPOSITE MATERIAL CONTAINING PLANT SEED

Herbert Angruner, Vienna, Austria, assignor to Bunzl and Biach Aktiengesellschaft, Vienna, Austria

Filed Apr. 19, 1973, Ser. No. 352,422
Claims priority, application Austria, Apr. 19, 1972, 3423/72
Int. Cl. A01c *1/00*
U.S. Cl. 111—1 **11 Claims**



1. Method of laying composite webs containing plant seeds over a field surface comprising:

treating said field surface by producing a water-permeable gravel foundation, applying and solidifying a layer of sand, applying a complete fertibilizer having depot action, applying a vegetation layer and compacting it, applying a complete fertilizer which is immediately absorbable, and slightly roughening the surface;

then laying the composite webs over the surface of the field;

sewing the edges of the webs to each other;

fastening the webs to the ground by removable wire clamps; and

spreading a thin layer of sand in an amount of about 0.3 to 1 kg/m².

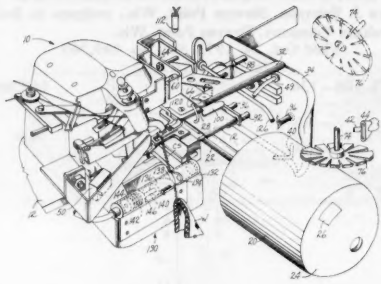
3,890,911

AUTOMATIC HEMMING MACHINE

Edward S. Babson, Ipswich; John W. Brennan, Salem; Robert F. Gorini, Beverly, and Ronald C. Mason, Hamilton, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 11, 1974, Ser. No. 460,165
Int. Cl. D05b *21/00, 35/10, 37/04*
U.S. Cl. 112—121.12 **13 Claims**

11. In combination with an overedging machine hairing stitch forming means, inner and outer hemmers movable into and out of cooperative relation, an edge gage, and feed mechanism for feeding the peripheral margin of a tubular work piece to be hemmed in a path extending along the gage, through the hemmers, and through the operating locality of the stitch forming means, an automatic work guidance mechanism comprising a drum-like rotary work feeder having an axis generally normal to said path and adapted loosely to receive and support the workpiece, and a movable member frictionally engageable with portions of the workpiece to urge it axially of the work feeder during hemming, means responsive during a cycle of hemming operation first to the unfinished marginal edge of the workpiece and then to the finished edge of the workpiece for controlling said automatic guidance mechanism, means for moving the hemmers into and out of cooperative relation, means for ejecting the workpiece from the machine, means for terminating operation of the stitch forming means to provide chain-off, means for severing the chain-off, and control mechanism including a trigger responsive to the finished edge for automatically and sequentially



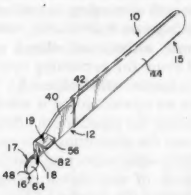
actuating said means for moving the hemmers out of cooperative relation, sais means for ejecting the workpiece from the machine, said means for terminating operation of the stitch forming means to provide chain-off after the hemming has overlapped, and then said means for severing the chain-off to release the finished workpiece.

3,890,912

HAND TOOL FOR OPENING CANS

Claude A. Young, 126 Kensington, LaGrange, Ill. 60525

Filed Sept. 30, 1974, Ser. No. 510,618
Int. Cl. B67b *7/00*
U.S. Cl. 113—1 K **8 Claims**



1. A can opener of the type adapted to open cans by unfolding the can ridge that is formed at one end of the can by folding the end rims of the can end closure and can side wall against the side of the can to define one ridge edge that projects away from the can, a second opposing ridge edge that lies about the can side wall, and a composite flange structure separating said ridge ends that lie about the can side wall in juxtaposition therewith, said opener comprising:

a lever having a hand grip portion at one end of same,

with the other end of said lever defining a blade portion,

said blade portion defining a rounded working edge that is convexly rounded longitudinally of said lever and is grooved longitudinally of same,

said working edge being offset to one side of said lever approximately 0.090 inch but being in substantial parallelism with said lever hand grip portion,

with said groove being proportioned to define along the side of said blade portion edge that is at said one side of said lever a marginal wedging rim proportioned to be wedged between the can ridge second edge and the can side wall, and a fulcrum element fixed to said lever and adjacent said blade portion and between same and said hand grip portion and projecting laterally of said blade portion, in

the direction said blade portion is offset from said hand grip portion, for placing same on the can ridge one edge for fulcrum serving purposes,

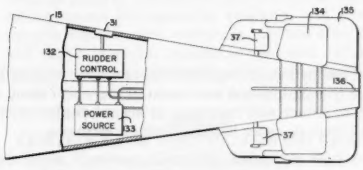
whereby, when the side of said blade portion at said one side of said lever is placed in substantial tangency with the can side wall with said working edge engaging the can ridge second edge and the fulcrum element engaging the can ridge one edge, said lever hand grip portion may be actuated by hand axially of the can to effect a swinging of the can ridge flange structure about the can ridge one edge and away from the can side wall to a diagonally directed relation with the can side wall, with the ridge second end projecting at an obtuse angle relative to the can side wall, whereupon the can end may be separated from the can side wall by drawing the can end away from the can side wall.

3,890,913

SINGLE COMMAND ACOUSTICAL GUIDANCE SYSTEM

Herman E. Ellingson, Silver Springs, Md., and Gilbert Lieberman, Haddonfield, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1961, Ser. No. 86,825
Int. Cl.[2] F42B *19/00*
U.S. Cl. 114—20 R **9 Claims**



1. A method of destroying a target with a homing torpedo comprising the steps of detecting the target range and bearing in a passive manner, computing the expected target position after a predetermined period of time from the initially detected range and bearing, adjusting a torpedo turning means mounted on the torpedo prior to the launching of the torpedo to cause the torpedo to turn through a fixed angle upon actuation by a signal, launching the torpedo toward the expected target position, rotating a disc having indicia at a position remote from the torpedo, rotating a disc on the torpedo in synchronism with the indicia bearing disc, generating an acoustic signal only when the torpedo is approximately a predetermined distance from the target to actuate the turning means, the direction of the torpedo turn being controlled by the position of the disc on the torpedo, generating the acoustic signal exactly at a time indicated by the indicia bearing disc corresponding to the direction of the target relative to the torpedo, whereby the torpedo is directed to an area where it can home on the target.

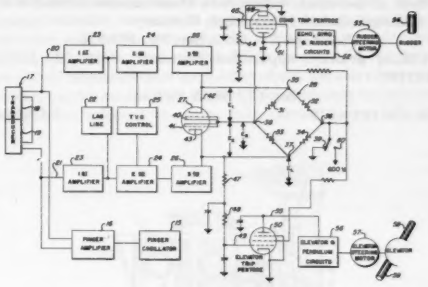
3,890,914

TORPEDO CONTROL SYSTEM

Paul C. Gardner, Scotia, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1950, Ser. No. 188,465
Int. Cl.[2] F42B *19/01*; **G01S** *9/66*
U.S. Cl. 114—23 **11 Claims**

1. In an automatic steering system for directing a moving body equipped with motorized steering gear toward a source of wave energy, means energized by said wave energy for generating separate dc voltages of relative magnitudes varying with the directional relationship of said source to said body, an amplitude comparator bridge including four resistor arms in endless series differentially energized by said voltages applied across first and second adjacent arms of said series and adapted to provide across a third arm of said series a control voltage of a polarity depending on the relative magnitudes of



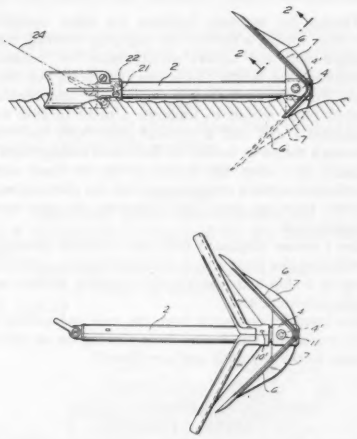
said separate voltages, and means controlling the steering gear motor in accordance with the polarity of said control voltage.

3,890,915

ANCHOR

L. Francis Herreshoff, deceased, late of Marblehead, Mass., and by Muriel D. Vaughn, executrix, Marblehead, Mass., assignors to Margarete L. Stinnes, New York, N.Y.

Filed Oct. 12, 1973, Ser. No. 405,812
Int. Cl. B63b *21/34*
U.S. Cl. 114—207 **10 Claims**



1. An anchor comprising a shank; a pair of anchor arms extending inclined with respect to each other from one end of said shank to opposite sides of the latter; a shackle fastened to the other end of said shank; and a stock member having a pair of straight arms projecting to opposite sides of said shank and being movable on the latter from a working position in which said stock member is located in the region of said other end of said shank and its straight arms are located substantially in a plane normal to the plane in which said anchor arms are located, to a storing position in which the straight arms of the stock member are located closely adjacent to and substantially in the same plane as said pair of anchor arms, each of the straight arms of the stock member having a front face facing away from said one end of said shank and being concavely curved in a direction transverse to the longitudinal direction of the respective arm of said stock member.

3,890,916
FENDER FOR MOORING POSTS OR THE LIKE

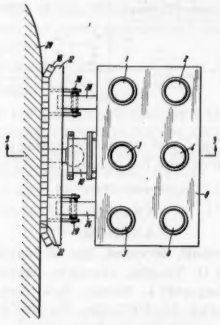
Josef Tummers, Heimgarten, and Walter Pisarik, Hattingen, both of Germany, assignors to Mannesmannrohren-Werke Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 24, 1973, Ser. No. 399,930

Claims priority, application Germany, Sept. 22, 1972, 2247197

Int. Cl.[2] B63B *59/02*

U.S. Cl. 114—219 **2 Claims**



1. Fender for mooring facilities for ships comprising a fender body having a surface for engaging mooring ships:

a single ball and socket arrangement for cardanically mounting the fender to the mooring facility on the other side from the surface at a single point and centrally located pivot mount to undergo a pivot motion about a horizontal axis and a vertical axis, both axes running through the pivot mount, so that upon engagement of the fender by a ship, the fender pivots on these axes into surface-to-surface engagement with the ship and independently from any force as exerted by the ship upon the fender; and

resilient means displaced from the cardanic mounting for centering the fender in a normal position, when not engaging a ship and wherein the engaging surface is vertically oriented; and

means laterally displaced from the ball and socket mount for preventing the fender from turning on an axis transverse to the engaging surface thereof.

3,890,917
MARINE FENDERS

John Morton Ackroyd, Windsor, and Graham Arthur Nigel Hart, Aylesbury, both of England, assignors to Firestone Burleigh Marine Pneumatic Fendering Company Limited, Middlesex, England

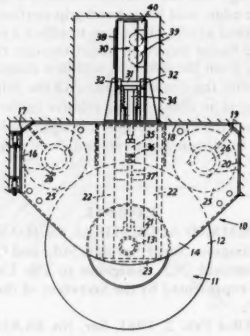
Continuation-in-part of Ser. No. 218,892, Jan., 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,697

Claims priority, application United Kingdom, Jan. 19, 1971, 2685/71

Int. Cl. B63b *21/04*

U.S. Cl. 114—220 **10 Claims**

1. A fender unit comprising a supporting structure, a wheel mounting, a wheel having a pneumatic tire and means mounting said wheel for rotation about a vertical axis in said wheel mounting, said supporting structure having guide means for guiding the movement of said wheel mounting for guided movement in a rectilinear path perpendicular to said axis inwardly from and outwardly towards an outer limiting position, at least one roller and means mounting said roller in the supporting structure for rotation about a fixed vertical axis, said roller being in engagement with the pneumatic tyre of the wheel resiliently to resist inward movement of the wheel along



said path, and hydraulic control means operative to apply high resistance to initial inward movement of the wheel along said path and to reduce said resistance as inward displacement of the wheel from its outer limiting position increases.

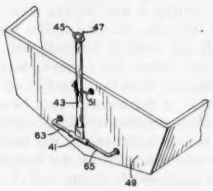
3,890,918
SKI BAR

James F. Sell, R.R. 3, Box 157, Muncie, Ind. 47302

Filed Jan. 21, 1974, Ser. No. 434,854

Int. Cl. B63b *21/56*

U.S. Cl. 114—235 WS **6 Claims**



1. An accessory for attachment to a stern side wall of a power boat for providing a relatively high, easy release tow rope attachment point above the general level of the boat stern comprising:

an elongated tubular member;

a ring affixed to the tubular member near one end thereof through which a tow rope bight may be passed;

means near the other end of the tubular member for attaching the said other end to the stern side wall comprising a pair of at least L-shaped members each threaded near one end thereof and adapted to attachably pass through the stern side wall; and

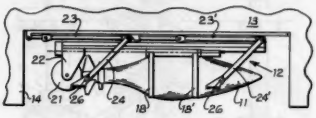
means intermediate the tubular member ends for attaching the tubular member to the stern side wall near the upper edge thereof.

3,890,919

EXTERNAL LAUNCHER FOR UNDERWATER WEAPON

Everett W. Opdahl, Lutherville, and Chang-Kyo Kim, Severna Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 25, 1974, Ser. No. 491,712
Int. Cl.[2] B63G 8/32
U.S. Cl. 114—239 **3 Claims**



1. A launching device for an underwater weapon carried externally by an undersea vehicle having a recess therein comprising,

a launching system comprised of a first launching rail and a second launching rail slidably and extendably attached to said first launching rail,

means attached to said undersea vehicle for moving said launching system into and out of said recess, and

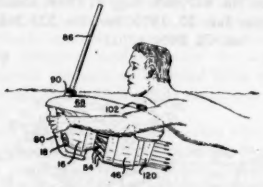
a carriage slidably attached to said second launching rail having means for releasably retaining said underwater weapon whereby said weapon is released after said second rail is extended relative to said first rail and said carriage moves longitudinally along said second rail.

3,890,920

CONTROLS FOR AQUATIC TOWING CRAFT

Eggert Buelk, Hamburg, Germany, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 6, 1973, Ser. No. 367,651
Int. Cl. B63b 21/56
U.S. Cl. 115—6.1 **5 Claims**



1. A unitary self-powered craft for towing an individual through water at or near its surface comprising; motive power means including means to produce a motive force when immersed in water, handle means on said craft to be grasped by an individual whereby said individual is propelled through the water when said craft is in operation said handle means being fixed and vertically oriented with respect to said craft and adapted to enable said person to control the direction of movement of said craft through the water, and means on said craft to cause said craft to turn in a constant arc of curvature when said handle means is released whereby said craft returns to substantially the same location occupied by the craft when said handle means was released.

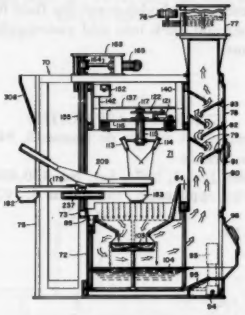
3,890,921

ROTATIVELY INDEXED SPRAY-PAINTING MACHINE

Harry Szczepanski, 900 Clancy N.E., Grand Rapids, Mich. 49503

Filed Nov. 1, 1971, Ser. No. 194,164
Int. Cl. B05c 11/12, 11/16
U.S. Cl. 118—4 **5 Claims**

1. A spray-painting machine including a housing defining a spray chamber, spray gun means disposed to project spray within said chamber, ventilation means operative to maintain a flow of air within said chamber, wash means providing at least one water curtain within said chamber, and carrier means rotatably mounted in said housing on a vertical axis of rotation, said carrier means having at least two sets of related workpiece-holding and mask-holding means, said sets being angularly displaced from each other about the axis of rotation of said carrier means, said machine also including an indexing mechanism adapted to rotate said carrier means between



positions in which each of said sets is, in turn, placed at said loading station and in said chamber, wherein the improvement comprises:

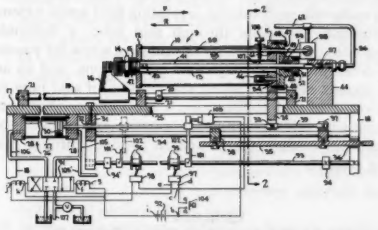
actuating means operative to move the mask-holding means of said two sets oppositely, respectively, to spraying position in said chamber and a position providing clearance over said loading station, said mask-holding means being a unitary structure pivotally mounted on said carrier means at the central portion thereof and adapted to rock between said opposite positions.

3,890,922

SEALANT APPLYING APPARATUS

George F. Nordenholt, 25 Dogwood Dr., Ft. Lauderdale, Fla. 07960

Filed Mar. 22, 1974, Ser. No. 453,837
Int. Cl. B05c 5/02
U.S. Cl. 118—7 **15 Claims**



1. Apparatus for delivering a ribbon of sealant material onto a workpiece, comprising: a closed-ended reservoir cylinder mounted for forward and rearward axial movement; a coaxial piston-cylinder located within said reservoir cylinder dividing it into a fluid containing piston chamber and a fluid reserve chamber; a fixed hollow piston rod within said piston chamber having openings near its one end and said rod extending outwardly of the forward end of said reservoir cylinder; said chambers communicating with one another through a one-way valve means on said cylinder; a sealant-containing feed

cylinder means interconnected with a pressurized sealant supply means; a first hydraulic actuator connected by means of its plunger to that of said feed cylinder means, said first actuator and said feed cylinder means having approximately the same volumetric capacity, and conduit means interconnecting said actuator with said fluid reserve chamber; whereby rearward movement of said reservoir cylinder pumps the fluid from said piston-cylinder and into said hydraulic actuator which causes the sealant to be discharged from the feed cylinder means, said sealant supply means refilling said feed cylinder means when needed and causing said fluid actuator to pump fluid into said reservoir, and whereby forward movement of said reservoir cylinder draws the fluid from said fluid reserve chamber and back into said piston-cylinder through said valve means.

3,890,923

ENROBING APPARATUS

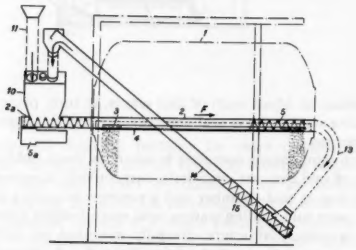
Bernard Dumoulin, 58 avenue de Bonneuil, 94 La Varenne Saint-Hilaire, France

Filed Jan. 3, 1974, Ser. No. 430,400

Claims priority, application France, Jan. 4, 1973, 73.00218

Int. Cl. A23g *3/20*

U.S. Cl. 118—19 **3 Claims**



1. Apparatus for coating various articles, such as food or pharmaceutical articles, with a powdered product, comprising an elongated hollow treatment drum having opposite ends, said drum being rotatable about a horizontal axis and adapted to receive said articles; distributing means extending through the entire length of said drum and comprising a tube having a first end adapted to receive said powdered product and an opposite end, said tube being provided in a portion thereof extending within the drum from the region of one of said opposite ends of the drum to the region of the other of said opposite ends with perforations, a rotating feed screw extending substantially coaxially through said tube, a helicoidal brush provided on the periphery of said feed screw for passing the powdered product through said perforations, and an adjustable shutter extending along said portion of said tube for partial closure of said perforations; a recycling conduit communicating with said first and said opposite end of said tube; and means for feeding the powdered product through said recycling conduit.

3,890,924

APPARATUS FOR WAXING A THREAD

Aloys Horstmann, Greven, Westphalia, Germany, assignor to Hamel G.m.b.H, Zwirnmaschinen, 44 Munster, Westphalia, Germany

Filed May 29, 1973, Ser. No. 364,537

Claims priority, application Germany, May 30, 1972, 2226311

Int. Cl. B05c *1/06*

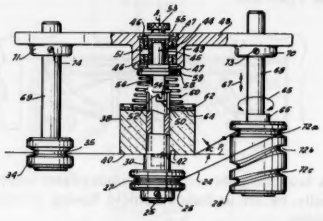
U.S. Cl. 118—78 **13 Claims**

1. An apparatus for waxing a thread being fed between two locations, said apparatus comprising:

a support,

a spindle on said support having and rotatable about a longitudinal axis and provided with an abutment defining on rotation a plane perpendicular to said axis;

an annular body of wax transfixed by said spindle and lying to one side of said plane, said body having one axial end at said plane bearing against said abutment, said thread passing over said one end;



means on and rotatable with said spindle for biasing said one end against said abutment, said abutment and said means constituting the sole elements axially limiting said body; and

a pair of thread guides on said support and defining with said spindle a path for said thread, at least one of said guides lying to said one side of plane with said path lying to said one side of said plane and forming an angle therewith between said one guide and the intersection of said thread and said body.

3,890,925

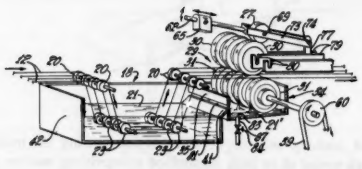
STRAND DOCTORING MEANS

Cletis L. Roberson, Newark; Robert G. Russell, Granville; Ralph M. Stream, Newark, and Harold E. Leaman, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 847,669, Aug. 5, 1969, abandoned. This application Jan. 22, 1973, Ser. No. 325,268

Int. Cl. B05c *11/02*

U.S. Cl. 118—104 **1 Claim**



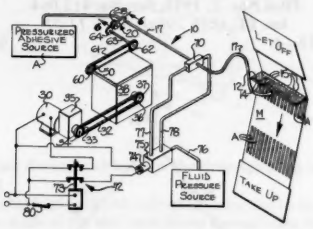
1. A die apparatus comprising at least two adjacent wheels rotating about parallel axes, said wheels further having elastomeric circumferential surfaces which cooperate to form an enveloping contact around a linear material passed between said surfaces, said contact being established to remove adjunctive material from said linear material in amounts dependent upon the pressure applied thereto by said surfaces; means for wetting the elastomeric circumferential surface of at least one of the wheels; and a means for selectively adjusting the contact pressure exerted on said linear material comprising an elongated member having one end pivotally attached to a fixed surface; a weight adjustably and removably affixed to the end region of said elongated member distal to said fixed surface; and a fulcrum wheel rotatably secured to an intermediate region of said elongated member, said fulcrum wheel being positioned in rolling contact with the circumferential surface of at least one wheel of said die apparatus to thereby exert a distributed force on said wheel dependent upon the size and relative position of said weight.

3,890,926

APPARATUS FOR INTERMITTENTLY APPLYING DEPOSITS OF ADHESIVE ONTO A MOVING WEB OF MATERIAL

Richard K. Teed, Greenwood, S.C., assignor to Riegel Textile Corporation, New York, N.Y.

Filed July 25, 1974, Ser. No. 491,765
Int. Cl. B05c 5/02
U.S. Cl. 118—325 8 Claims



7. Apparatus for intermittently applying deposits of adhesive at predetermined locations on a face of a moving web of material; said apparatus comprising:

adhesive extruding head means comprising a generally flat plate member having a forward, straight, longitudinally-extending edge positioned adjacent and transversely across the face of the moving web, said plate member including internally thereof a plurality of interconnected channels for receiving and conveying adhesive therethrough, and a plurality of extruding port means spaced along the length of said forward edge and connected with said channel for receiving adhesive therefrom and for extruding adhesive onto the face of the moving web of material in a predetermined pattern of spaced-apart longitudinally-extending sets of lines;

adhesive supply and conduit means connected with said channels of said extruding head means for containing a supply of adhesive under pressure and for conveying the adhesive to said extruding head means;

selectively operable, metering pump means positioned in said adhesive conduit means for selectively pumping metered amounts of adhesive from said supply means through said conduit means to said extruding head means; and

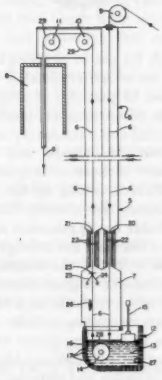
control and drive means connected with said pump means for selectively operating said pump means intermittently for predetermined time periods for timed, intermittent, metered pumping action of adhesive to said extruding head means for timed intermittent application of adhesive onto the face of the moving web of material at predetermined intervals to form longitudinally spaced-apart sets of lines of predetermined length at predetermined intervals, said control and drive means comprising motor means, first mechanical drive means connected with and driven by said motor means, cam means connected with said first mechanical drive means for being rotated thereby, cam follower means in engagement with said cam means for being linearly reciprocated back and forth thereby, rack and pinion gear means in which said rack means is connected with said cam follower means for reciprocating back and forth linear movement therewith and for rotating said pinion back and forth thereby, second mechanical drive means connected with said pump means for driving said pump means during operation thereof, and one-way clutch means connected between said pinion and said second mechanical drive means for operating said second mechanical drive means during rotation of said pinion means in one direction and for not operating said second mechanical drive means during rotation of said pinion means in the other direction, whereby said pump means is intermittently driven for predetermined time periods in relation to the profile of said cam means.

3,890,927

APPARATUS FOR TREATING TIRE CORD FABRIC

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 25, 1974, Ser. No. 463,937
Int. Cl. B05c 3/12
U.S. Cl. 118—419 4 Claims



1. An apparatus for treating tire cord fabric, comprising:

a. a dip tank containing a liquid coating comprising a mixture of a substance for promoting the bond between the warp cords of the tire cord fabric and rubber material in which the fabric is later embedded, and a vaporizable solvent which is chemically compatible with the substance, the dip tank including a series of fluid passageways which are adjacent surfaces of the dip tank coming in contact with the liquid coating and sealed from liquid coating in the dip tank;

b. means for sealing the dip tank from the ambient atmosphere;

c. an applicator drum, rotatable in the dip tank, for directing tire cord fabric into the liquid coating, the drum including a series of fluid passageways which are sealed from the liquid coating and disposed adjacent the outer cylindrical surface of the drum;

d. means for cooling the applicator drum to a temperature sufficient to reduce the rate of evaporation of the solvent occurring when the drum is not cooled, said means including means for circulating cooling fluid through the fluid passageways of the drum; and

e. means for cooling the dip tank to help reduce the rate of evaporation of the solvent, said means including means for circulating cooling fluid through the fluid passageways of the dip tank, the cooling fluid circulated through the drum and dip tank being a liquid at a temperature in the range of from 35° to 50°F.

3,890,928

MAGNETIC BRUSH FOR USE IN DEVELOPING ELECTROPHOTOGRAPHIC IMAGES

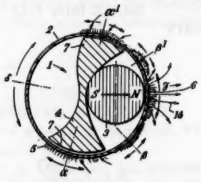
Peter Jeanmaire, Wettswil, and Paul Heinzer, Zurich, both of Switzerland, assignors to Wifo Wissenschaftliches Forschungs-Institut A.G., Zurich, Switzerland

Filed Dec. 20, 1973, Ser. No. 426,578

Claims priority, application Switzerland, Dec. 28, 1972, 18946/72

Int. Cl. G03g *13/06*

U.S. Cl. 118—637 6 Claims



1. A magnetic brush for use in applying to a latent electrophotographic image on a carrier sheet a developer powder composed of a mixture of particles of magnetizable material and a powdered toner, comprising a rotatable hollow cylinder of non-magnetic material and a stationary magnetic excitation system disposed within the cylinder and producing at the surface of the cylinder successive magnetic field zones of medium intensity sufficient to take up the developer powder zones, of higher intensity for causing filaments to project radially from the cylinder for application of toner powder to the image and zones of intensity low enough to shed the developer powder from the cylinder, the magnetic excitation system comprising a permanent magnet extending axially of the cylinder in a position offset from the axis of the cylinder with its axis of magnetization extending radially with respect to the cylinder and one pole in close proximity to the inner wall of the cylinder, and a screen of magnetizable material also extending axially of the cylinder and disposed adjacent the other pole of the magnet.

3,890,929

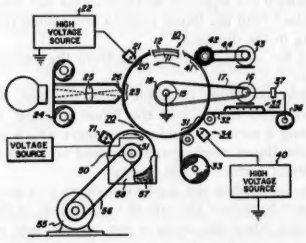
XEROGRAPHIC DEVELOPING APPARATUS

Lewis E. Walkup, Honolulu, Hawaii, assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 332,851, Feb. 15, 1973. This application May 24, 1974, Ser. No. 473,027

Int. Cl. G03g *13/06*

U.S. Cl. 118—637 8 Claims



1. An apparatus for developing a latent electrostatic image recorded on an image retaining member comprising:

a. a donor member for supporting a uniform layer of electroscopic developing material adjacent the image retaining member, said donor member and image retaining member being spacially disposed as to create a space gap between both members; and

b. means to introduce a pulse electrical bias across said gap, said pulse being of a strength and a duration sufficient to enable the deposition of the electroscopic material onto the charged image areas and prevent the development of non-image areas.

3,890,930

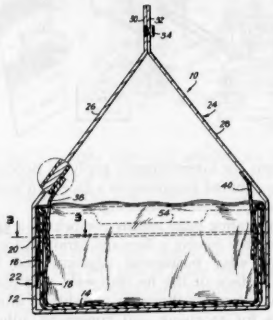
ANIMAL COMMODE

Michael A. Clark, 476 Bradford St., Brooklyn, N.Y. 11207

Filed Nov. 2, 1973, Ser. No. 412,064

Int. Cl. A01k *29/00*; A47k *11/02*

U.S. Cl. 119—1 9 Claims



1. In an animal commode, inner container means for receiving an animal, said inner container means having a bottom wall and side walls extending upwardly from the periphery of said bottom wall while being open at the top, so that an animal can enter into said inner container means, liner means removably carried by said inner container means and lining the interior thereof, so that from time to time said liner means can be removed from said inner container means and replaced by another liner means, and outer means extending beneath said inner container means around the latter and over the top thereof while leaving said inner container means freely accessible to an animal at least at one end of said outer means, said outer means having over said container means an upper portion blocking the interior of said inner container means from view at least from above and said upper portion of said outer means being movable with respect to the remainder of said outer means to and from a normal position located over said inner container means, so that when said upper portion of said outer means is moved away from said normal position thereof said inner container means is freely accessible for removal and replacement of said liner means, said outer means being in the form of a box in which said inner container means is located, and said upper portion of said outer means being in the form of a pair of swingable flaps of said box pitched toward each other and removably connected to each other over said inner container means for providing at opposed ends of the latter a pair of triangular openings through which an animal has free access to the interior of said inner container means.

3,890,931

SANITARY PET BOX

Helene Saver, 155 E. 49th St., New York, N.Y. 10017

Filed June 17, 1974, Ser. No. 480,046

Int. Cl. A01k *29/00*

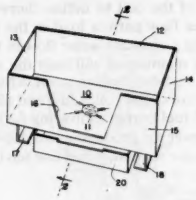
U.S. Cl. 119—1 1 Claim

1. A sanitary disposal device for pets comprising:

a. a metal box having a base member divided into four sections, each with sloping surfaces leading to a central drainage plate formed with a series of holes; said box also including a back wall, two side walls, and a front wall formed with a gate for each access by a pet;

b. two angle irons positioned under the base of said box for supporting it above a floor and thereby defining a space under the box;

c. a storage pan removably positioned in the space under the box for collecting liquid refuse from the box which



passes through the holes in the drainage plate in the base; and

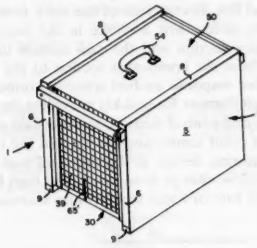
d. a metal folding shield removably attached to the back and side walls of the box; said shield formed with strips which are placed outside the box and formed with sloping corners at the end portions.

3,890,932

COLLAPSIBLE CONTAINER AND LATCHING MEMBER

Anthony V. Sanzone, 14513 Homerite Dr., San Jose, Calif. 95124, and Antonio C. Sanzone, 349 Richlee Dr., Campbell, Calif. 95008

Filed Oct. 9, 1973, Ser. No. 404,212
Int. Cl.[2] A01K *1/02*
U.S. Cl. 119—19 **16 Claims**



1. A collapsible container comprising:

a top and bottom wall member;

a front and rear wall member;

a first and a second side wall member;

an elongated member, said elongated member having a first and a second end;

means for pivotably connecting said first end of said elongated member to said first side wall member; and

means for releasably coupling said second end of said elongated member to said second side wall member wherein said coupling means includes:

an elongated stud, said stud being fixed to and having a portion projecting from said second side wall member;

a retaining member movably attached to said projecting portion of said stud;

a stud receiving slot adjacent said second end of said elongated member for receiving said projecting portion of said stud; and

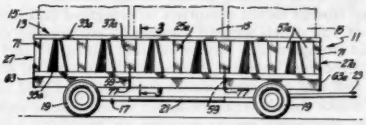
means adjacent said slot for receiving said retaining member and further wherein said retaining member and said retaining member receiving means adjacent said slot include means which cooperate for minimizing inadvertent decoupling of said second side wall member.

3,890,933

HAYING FEEDER

Edward Boehm, Rural Rte. 1, Mandan, N. Dak. 58554

Continuation-in-part of Ser. No. 339,208, March 8, 1973, abandoned. This application Mar. 1, 1974, Ser. No. 447,068
Int. Cl. N01k *5/00*
U.S. Cl. 119—60 **11 Claims**



1. A haying feeder for feeding livestock adapted to hold at least one large bale of hay comprising:

a peripheral wall at least substantially circumscribing a space into which the bale can be deposited, said space having a completely open upper end to permit the bale to be deposited in said space from above;

said peripheral wall including first and second generally opposed wall portions;

each of said wall portions including at least one strong structural section, at least one of said structural sections lying intermediate the ends of the associated one of said wall portions;

each of said structural sections having an inner surface which slopes inwardly as it extends downwardly, said inner surfaces of said structural sections being adapted to engage and at least partially support the bale in said space; and

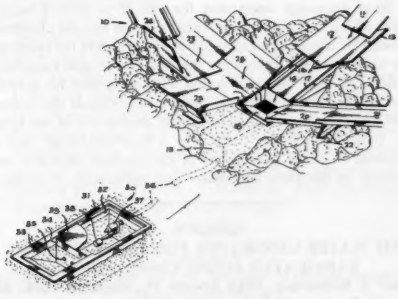
said peripheral wall having a plurality of openings therein, each of said openings being of sufficient size to receive the head of livestock whereby said openings make the bale in said space accessible to livestock.

3,890,934

WATER COLLECTION AND STORAGE DISPERSION APPARATUS

Frank R. Walcott, 1212 N. Ontario St., Burbank, Calif. 91505

Filed July 16, 1973, Ser. No. 379,553
Int. Cl. A01k *7/02*
U.S. Cl. 119—78 **5 Claims**



1. In a water collection and storage dispersion apparatus for use in a natural wildlife environment, the combination comprising:

a water storage means;

a rainfall water collecting means diverging with respect to said storage means for conducting a flow of rainfall water to said storage means for holding and storage purposes; water dispensing means remotely connected to said storage means via a flexible hose for supplying a quantity of water from said storage means to said dispensing means for immediate use by wildlife;

valve means operably connected to said hose for regulating the flow of water from said storage means to said dispensing means whereby the level of water in said dispensing means is maintained at a predetermined level;

said collecting means comprises a plurality of panels arranged with overlapping edge marginal regions so as to define an open-topped water conducting path in the form of a trough leading to said storage means;

said storage means comprises an elongated tank composed of wall panels secured together by interlocking ribs;

said storage means further includes a central panel having a recessed entrance leading to the interior of said tank and said collecting means terminating at said tank entrance for delivering collected water thereto; and

said dispensing means includes an enclosure having an enclosed immediate storage chamber and an open drinking chamber with fluid conducting means interconnecting said chambers.

3,890,935

HEAT EXCHANGE APPARATUS WITH GAS CHAMBER BELOW HEAT EXCHANGE BED

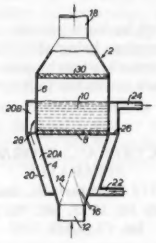
Norman Moss, Ilford; Barrie James Martin, Shenfield, and Michael John Broad, Enfield, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 16, 1973, Ser. No. 333,087

Claims priority, application United Kingdom, Mar. 2, 1972, 9693/72

Int. Cl. F28d *13/00*

U.S. Cl. 122—4 D **5 Claims**



1. Heat exchange apparatus for use in a central-heating system, which apparatus comprises first and second chambers separated by a gas-permeable plate, and a jacket for receiving water to be heated surrounding the first and second chambers, said first chamber being provided with an igniter for igniting a gaseous medium in said first chamber proximate the bottom of said jacket to form hot gases which, during use of the apparatus, pass through the plate into a heat exchange bed of particulate material positioned in the second chamber and supported on the plate to fluidize said particulate material.

3,890,936

HOT WATER GENERATOR FOR SHOCK TESTING FABRICATED PIPING COMPONENTS

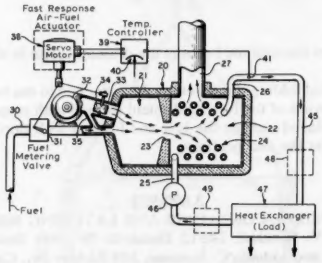
Michael J. McInerney, 1956 Beverly Pl., Highland Park; Robert T. Brady, 658 Prospect Ave., Elmhurst, and Alvia E. Phillips, 438 N. Ardmore, Villa Park, all of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Jan. 28, 1974, Ser. No. 437,249

Int. Cl. F22b *37/10*

U.S. Cl. 122—248 **8 Claims**

1. A hot water generator having a high turndown ratio for rapidly increasing the temperature of hot water to a point of substantially theoretical maximum heat absorption and temperature rise without nucleation, said generator comprising a housing defining connected substantially cylindrical coil and combustor sections, an annularly shaped helical coil axially aligned in the coil section having a plurality of longitudinally arranged rows and radially arranged layers of watertubes with an open central area for receiving combustion gases and defining a water flow path, an inlet at the outermost layer of said watertubes, an outlet at the innermost layer of said watertubes, piping outside the generator connected between the inlet and outlet of the coil to define therewith a continuous closed loop water flow path, a load in the piping, a pump in the piping causing a constant water flow in the flow path such that the pressure maintained will limit the water temperature to just below the nucleate boiling point, a flue gas outlet in the coil section outward of the coil, a fuel and air induction system including a fossil fuel burner delivering fuel to the combustor section and a blower for producing and delivering combustion air to the combustor section, a fuel line having a fuel metering



valve therein connected to the burner, a duct connecting the blower to the combustor section and having a damper for controlling combustion air, a combustion air bleed line ahead of the damper for continually bleeding a small amount of air directly into the fuel line downstream of the valve to maintain combustion stability at low fire, a choke in the housing between the combustor section and the coil section directing combustion gases from the combustor section to the central area of the coil, a fast response air-fuel actuator connected to the fuel valve and air damper for quickly providing the necessary air fuel supply, and control means operating said actuator in response to a set point temperature input and the input of a temperature measuring device at the outlet of said coil to control fuel and air flow change from low fire to high fire and produce a maximum rate of water temperature increase without nucleation.

3,890,937

DISTRIBUTOR DRIVE ARRANGEMENT FOR A ROTARY COMBUSTION

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

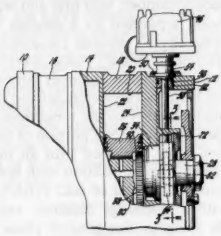
Filed Apr. 25, 1974, Ser. No. 463,913

Int. Cl. F02b *53/12, 53/14*

U.S. Cl. 123—8.45 **2 Claims**

1. A rotary combustion engine comprising housing means having internal walls cooperatively defining a cavity, a crankshaft having an eccentric located in said cavity, a pair of crankshaft journal bearing means rotatably supporting said crankshaft in said housing on opposite sides of said eccentric, a rotor rotatably mounted on said eccentric in said cavity, a rotary phasing gear concentric with said eccentric and fixed to one side of said rotor, one of said crankshaft journal bearing means comprising a stationary phasing gear fixed to said housing means and meshing with said rotary phasing gear, said rotor cooperating with said walls of said housing to provide a plurality of chambers that are spaced about and move with said rotor while varying in volume as said rotor and said crankshaft rotate, intake passage means for supplying said working chambers with a combustible mixture, a spark plug for igniting the mixture in said working chambers, exhaust passage means for exhausting said working chambers, a distributor for oper-

ating said spark plug comprising a stationary body secured to said housing means, a distributor shaft rotatably supported in said distributor body and extending within said housing means to said stationary gear, a distributor driving gear concentric with and fixed to said crankshaft adjacent said stationary gear, a distributor driven gear concentric with and fixed to said



distributor shaft, and means for rotatably supporting said distributor shaft in said stationary gear whereby said stationary gear provides a bearing support for both said distributor driving gear and said distributor driven gear to assure accurate relationship between their axes to minimize gear backlash and consequently ignition spark scatter.

3,890,938

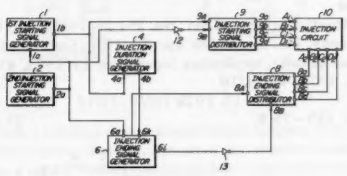
ELECTRICAL FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Kazuo Oishi; Noriyoshi Ando, and Hiroshi Yoshida, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 97,880, Dec. 14, 1970, abandoned. This application Apr. 19, 1973, Ser. No. 352,697

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 EA **22 Claims**



1. A system for electrically controlling fuel injection in a multi-cylinder internal combustion engine comprising in combination:

a first starting signal generator for generating a first fuel injection starting signal at a predetermined angle in each cycle of operation of a selected reference cylinder, said starting signal being generated in synchronism with the rotation of said engine,

a second starting signal generator for generating a plurality of succeeding fuel injection starting signals in synchronism with the rotation of said engine, each of said succeeding fuel injection starting signals defining the time at which fuel injection to a corresponding one of the remaining cylinders in said engine is initiated,

a duration signal generator connected to said first starting signal generator for generating a fuel injection duration signal, said signal having a time duration proportional to the quantity of fuel to be injected into said cylinders,

an ending signal generator connected to said second starting signal generator and to said duration signal generator for generating fuel injection termination signals, each of said signals defining the time at which fuel injection to a corresponding one of the cylinders is terminated, said ending signal generator comprising means for generating a saw-tooth waveform in synchronism with said succeeding fuel injection starting signals, means responsive to said duration signal for generating a duration signal termination signal, and means responsive to said saw-tooth waveform and said duration termination signal for generating fuel injection termination signals for each of said cylinders,

a fuel injection termination signal distributor connected to said ending signal generator for distributing said fuel injection termination signals successively to each of said cylinders in a predetermined order, and

a starting signal distributor connected to said first and second starting signal generators for distributing said succeeding fuel injection starting signals to said cylinders in said predetermined order.

3,890,939

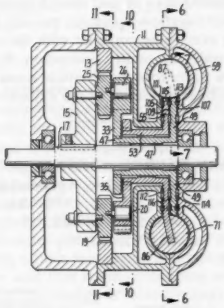
ROTARY ENGINE WITH IMPROVED SEAL AND TIMING MECHANISM PROVIDING LINEAR ACCELERATION BETWEEN PISTONS DURING THE POWER STROKE

Alex A. McIntosh, 1491 Benito Ave., Burlingame, Calif. 94010

Filed Mar. 22, 1973, Ser. No. 343,972

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.47 **10 Claims**



1. A rotary internal combustion engine, comprising:

a continuous cylinder having at least two pistons sealed to the walls thereof and capable of traveling completely around said cylinder,

at least one each of an intake port, an exhaust port and an ignition means communicating with said cylinder,

a drive shaft as a power output of said engine, and

means attached to said drive shaft for transferring power from said pistons thereto and for timing the relative motion of said pistons, said power transfer and timing means including means for causing the relative acceleration between said at least two pistons to be linearly increasing at least for a period following ignition, whereby an increased potential power of expanding gases after ignition is communicated with the drive shaft.

3,890,940

INTERNAL COMBUSTION ENGINE WITH INDIRECT FUEL INJECTION

Hans List, 126 Heinrichstrasse, Graz, Austria

Filed May 25, 1973, Ser. No. 364,530

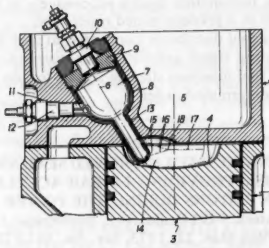
Claims priority, application Austria, May 25, 1972, 4554/72

Int. Cl. F02b *23/08*

U.S. Cl. 123—32 C **3 Claims**

1. In an internal combustion engine with indirect fuel injection, a cylinder having a cylinder axis, a piston located in said cylinder and having a piston head, a trough-shaped recess provided in said piston head, a cylinder head, a main combustion chamber formed between the cylinder head and the piston head, a hollow insert disposed in the cylinder head and

having an axis forming an acute angle with the cylinder axis, said insert forming an auxiliary combustion chamber, a plug closing said insert at one end and having a central bore, a fuel injection nozzle protruding into said central bore in alignment with the axis of said insert, a lateral bore in the cylinder head extending also into said insert, a spark plug disposed in said lateral bore and protruding into said insert, the insert having an axial extension opposite the fuel injection nozzle and having a smaller diameter than the remaining portion of the insert, said extension protruding into the main combustion chamber in a peripheral area of said trough-shaped recess of the piston head, two overflow apertures provided in said extension and having axes being coplanar with the cylinder axis and intersecting inside the main combustion chamber, said axes of the overflow bores forming identical acute angles with a reference plane which is normal to the cylinder axis.



3,890,941

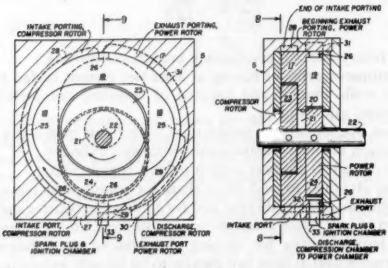
ROTARY ENERGY CONVERTER

Herman L. Paul, Jr., 720 Old Mill Rd., Wyomissing, Pa. 19510

Division of Ser. No. 392,072, Aug. 27, 1973. This application July 15, 1974, Ser. No. 488,717

Int. Cl. F02b *57/00*

U.S. Cl. 123—44 R **5 Claims**



1. In a rotary energy converter, a fixed housing provided with a cylindrical chamber for receiving and operably supporting a primary rotor, said housing being provided with an intake port and an exhaust port extending from the exterior thereof into open communication with the interior of said cylindrical chamber; a circular primary rotor mounted within said cylindrical chamber for rotation about its own fixed axis; said primary rotor being provided with a first symmetrical diametrically-extending parallel-sided chamber having its opposed ends arranged for open communication with the exterior of said primary rotor for passing communication with said intake port and with an intake channel associated therewith; a first circular secondary rotor operably positioned within the said first chamber of said primary rotor between the parallel sides thereof, said first secondary rotor being eccentrically affixed to a shaft operably mounted in said housing for rotation about an axis disposed in parallel offset relation with respect to the axis of rotation of said primary rotor; said primary rotor being provided with a second symmetrical diametrically-extending parallel-sided chamber having its opposed ends arranged for open communication with the exterior of said primary rotor for passing communication with said exhaust port and with an exhaust channel associated therewith, said second parallel-sided chamber having its longitudinal axis oriented at an angle with respect to the longitudinal axis of said first parallel-sidedchamber, said first and second parallel-sided chambers being separated by a median web having a central aperture whereby to provide clearance around said shaft; a second circular secondary rotor operably positioned within said second parallel-sided chamber between the parallel sides thereof and being eccentrically affixed to said shaft at an orientation complementary to the longitudinal axis of said second parallel-sided chamber; one portion of the wall of said cylindrical chamber being provided with an intake channel having an end in open communication with said intake port and another portion of the wall of said cylindrical chamber being provided with a discharge channel, said intake and discharge channels lying in the general plane of said first parallel-sided chamber; the wall of said cylindrical chamber being provided with a transfer channel having one end in open connunication with an end of said discharge channel and its other end extending for communication with the said second parallel-sided chamber; another portion of the wall of said cylindrical chamber being provided with an exhaust channel having one end in open communication with said exhaust port and its other end closed, said exhaust channel lying in the general plane of said second parallel-sided chamber; and a spark plug mounted on said housing intermediate said intake and exhaust ports and extending radially inwardly toward communication with said second parallel-sided chamber whereby to permit said rotary energy converter to operate as a two-stage internal combustion engine.

3,890,942

REDUCTION OF NO_x, HC, AND CO IN THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

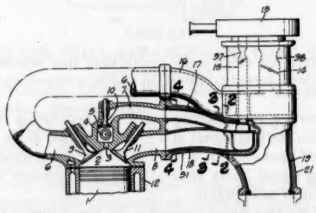
Tasuku Date, Tokyo; Shizuo Yagi, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 291,254, Sept. 22, 1972, abandoned. This application Apr. 23, 1973, Ser. No. 353,786

Claims priority, application Japan, Jan. 11, 1972, 47-4973; Mar. 6, 1972, 47-22210

Int. Cl. F02b *19/10, 19/18*

U.S. Cl. 123—75 B **27 Claims**



1. A method for obtaining substantially complete combustion in a four-cycle spark-ignition internal combustion piston engine while minimizing production of unwanted emissions such as NO_x, HC and CO in the engine exhaust gases, comprising the steps of: introducing two separate mixtures of air and fuel into a main combustion chamber at separate locations and in a manner to minimize the mixing of the two mixtures during both the suction and compression strokes of the piston, one said mixture being substantially richer in fuel content, said richer mixture being introduced into the main combustion chamber through an auxiliary chamber and torch opening connecting the chambers, controlling the amount of richer mixture introduced into the main combustion chamber

to form a smaller volume than the other mixture, simultaneously compressing both mixtures with part of the richer mixture being returned through the torch opening into the auxiliary chamber, maintaining quiescence and minimum turbulence within the main combustion chamber during and at the end of the compression stroke, spark-igniting the compressed mixture in the auxiliary chamber to project a torch flame through the torch opening to ignite the quiescent mixtures in the combustion chamber, the torch opening being placed so that the torch flame axis extends symmetrically from the auxiliary chamber toward the axis of the piston and inclined with respect thereto, the torch flame producing a continuing combustion of the air-fuel mixtures in the main combustion chamber, the resulting temperature rise in the main chamber reaching a peak and then falling from the peak less than one-half of the amount of the rise during the remainder of the power stroke.

3,890,943

VALVE ROTATING DEVICES

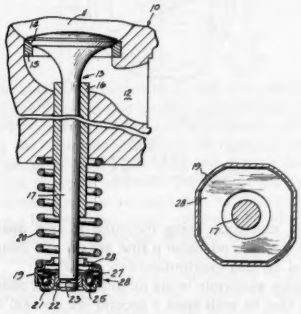
Herbert Schonlau, and Walter Meyerhoff, both of Hannover, Germany, assignors to Teves-Thompson GmbH, Germany

Filed Dec. 3, 1973, Ser. No. 421,116

Claims priority, application Germany, Dec. 11, 1972, 2260628; Dec. 11, 1972, 2260726

Int. Cl. F01l *1/32*; **F16k** *29/00*

U.S. Cl. 123—90.3 **6 Claims**



1. A valve rotating device comprising a housing arranged to seat a valve spring thereon, a retainer cap received within said housing, a spring washer having its inner periphery bottomed on said retainer cap, a valve having a valve stem secured to said retainer cap, and shiftable means acting between said spring member and said retainer cap to incrementally rotate said retainer cap during axial movement of said valve stem within said housing, said spring member being enclosed entirely by said housing in closely spaced relation thereto, said spring member and said housing each having complementarily shaped straight sided portions preventing relative rotation between the two.

3,890,944

ELECTRONIC IGNITION SYSTEM WITH AUTOMATIC IGNITION ADVANCEMENT AND RETARDATION

Peter Werner, Stuttgart, and Ulrich Drews, Schwieberdingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

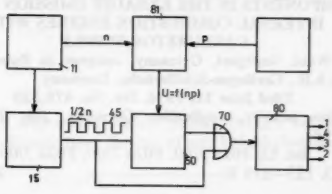
Filed Oct. 3, 1973, Ser. No. 403,170

Claims priority, application Germany, Oct. 7, 1972, 2249322

Int. Cl. F02p *5/04*

U.S. Cl. 123—117 R **8 Claims**

1. In the ignition system of an internal combustion engine, in combination, igniting means having a control input and operative for igniting a combustion mixture in an engine cylinder of the engine upon receipt of an ignition signal at said control input; transducer means for determining the value of at least one engine operating variable; a timing circuit comprised of energy-storing timing means, first means operative for effecting a first change of stored energy of said energy-storing timing means during the time the engine crankshaft moves through a predetermined angle, and second means operative subsequent to the completion of said first change of stored energy for effecting an opposite second change of stored energy of said timing means, at least a predetermined one of said first and second means comprising means connected to said transducer means and operative for effecting the respective change of stored energy of said energy-storing timing means at a rate of energy change dependent upon the value of said engine operating variable; and ignition signal generating means connected to said energy-storing timing



means and connected to the control input of said igniting means and operative for applying to said control input of said igniting means an ignition signal upon completion of said second change of stored energy, wherein said first and second means together comprise synchronizing means for generating a crankshaft-position-synchronizing signal when the engine crankshaft assumes a predetermined angular orientation, bistable frequency-dividing means having an input connected to said synchronizing means for receipt of crankshaft-position-synchronizing signals therefrom, and having two stable states, and wherein said first means comprises means operative for effecting said first change of stored energy when said bistable means is in a predetermined one of the two stable states thereof, and wherein said second means comprises means operative for effecting said second change of stored energy when said bistable means is in the other of the two stable states thereof.

3,890,945

EXHAUST GAS CLEANING SYSTEM FOR INTERNAL COMBUSTION ENGINES

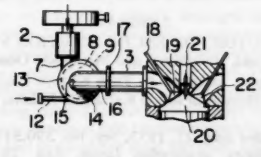
Kenji Goto, and Norikatsu Ishikawa, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed Jan. 31, 1974, Ser. No. 438,424

Claims priority, application Japan, Mar. 19, 1973, 48-30906; Apr. 7, 1973, 48-39139

Int. Cl. F02b *33/00*

U.S. Cl. 123—119 A **13 Claims**



1. In an engine exhaust gas cleaning system in which a portion of engine gases are recirculated from an engine exhaust system to an intake system of an internal combustion

engine so as to reduce nitrogen oxide content in the engine exhaust gases,

the improvement comprising a cylindrical chamber interposed between a carburetor and an intake pipe of the engine, an exhaust gas recirculation conduit providing fluid communication between an exhaust pipe of the engine and said cylindrical chamber, and a mixture conduit providing fluid communication betweenm the carburetor and said cylindrical chamber and having its outlet tangentially connected to the latter for establishing a swirling flow therein to promote mixing between the air-fuel mixture from the carburetor and the recirculated exhaust gases from the exhaust pipe.

3,890,946
METHOD AND SYSTEM TO REDUCE NOXIOUS COMPONENTS IN THE EXHAUST EMISSION FROM INTERNAL COMBUSTION ENGINES WITH CARBURETOR SUPPLY

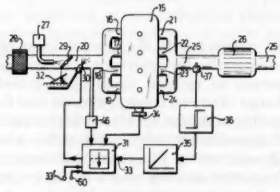
Josef Wahl, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed June 12, 1974, Ser. No. 478,520

Claims priority, application Germany, July 21, 1973, 2337198

Int. Cl. F02b *3/00;* **F02n** *7/00;* **F02d** *5/00*

U.S. Cl. 123—119 R **22 Claims**



1. Method to reduce noxious components in the exhaust from internal combustion engines having a carburetor to supply a fuel-air mixture to the engine, comprising the steps of

supplying fuel from the carburetor to the engine in a quantity less than that forming a stoichiometric level to supply a lean fuel-air mixture to the engine;

sensing the composition of the exhaust gases by testing oxygen content therein, and providing a sensing signal representative of oxygen in the exhaust gases;

intermittently injecting fuel to the fuel-air mixture being supplied to the engine;

and controlling the injection time, for each injection of fuel, in dependence on sensed composition of the exhaust gases by injecting fuel during respectively longer, or shorter time intervals, as the sensed composition of the exhaust gases changes between lean ($\lambda > 1$) and rich ($\lambda < 1$) mixture to provide an overall fuel-air mixture being applied to the engine which is just below stoichiometric value.

3,890,947
DISTRIBUTOR FOR ENGINE IGNITION SYSTEM

Masao Shibagaki, Hiroshima, and Masayoshi Oonishi, Himeji, both of Japan, assignors to Toyo Kogoyo Co., Ltd., Hiroshima and Mitsubishi Kenki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 22, 1973, Ser. No. 390,517

Claims priority, application Japan, Aug. 29, 1972, 47-100785

Int. Cl. F02p *5/04*

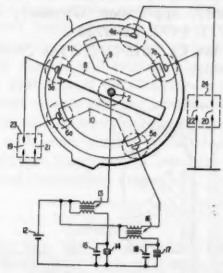
U.S. Cl. 123—148 DS **3 Claims**

1. An ignition system comprising

a first ignition plug,
a second ignition plug,
a third ignition plug,
a fourth ignition plug,
a first ignition coil,
a second ignition coil,
a first peripheral electrode,
a second peripheral electrode,
a third peripheral electrode,
a fourth peripheral electrode,
a fifth peripheral electrode,

said first, second, third, fourth and fifth peripheral electrodes being mounted to a distributor cap so that each of said peripheral electrodes is equidistant from the center of said distributor cap and so that said peripheral electrodes are disposed in a clockwise direction with the second electrode 90° from the first electrode, the fourth electrode 45° from the second electrode, the fifth electrode 90° from the fourth electrode and the third electrode 90° from the fifth electrode,

a distribution rotor having the same center as said distribution cap,



a first rotor electrode being mounted to said distribution rotor so that its ends span a first arc on said distribution rotor and on said distribution cap of 90°,

a second rotor electrode being mounted to said distribution rotor so that its ends span a second arc on said distribution rotor and on said distribution cap of 90° and so that said first arc and second arc are diametrically opposed,

a third rotor electrode being mounted to said distribution rotor so that its ends span a third arc on said distribution rotor and on said distribution cap of 180° and so that the ends of said third electrode lie midway between adjacent ends of said first and second rotor electrodes,

means connecting said first ignition coil to said third rotor electrode,

means connecting said second ignition coil to said fifth peripheral electrode,

means connecting said first ignition plug to said first peripheral electrode,

means connecting said second ignition plug to said second peripheral electrode,

means connecting said third ignition plug to said third peripheral electrode,

means connecting said fourth ignition plug to said fourth peripheral electrode.

3,890,948
ALTERNATOR DRIVEN CAPACITOR POWER SYSTEM

Floyd M. Minks, Kissimmee, Fla., assignor to Brunswick Corporation, Chicago, Ill.

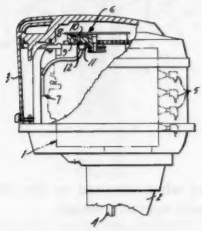
Filed June 13, 1968, Ser. No. 736,789

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **13 Claims**

1. An alternator driven capacitor discharge system having an alternator including at least a pair of winding means having

overlapping alternating current output voltages connected to charge an energy storage means during a given portion of each cycle of the output of each of the winding means, said storage means being connected in an output circuit with a switch means having a control input means, the improvement comprising firing means connected to said control input means and to both of said winding means and responsive to the relative amplitude and phase of the voltages produced by each cycle of the output of both of said winding means to actuate said switch means during each cycle and discharge the energy in said storage means in timed relation to the rotation of said alternator with the same winding means that charges said energy storage means operative to actuate said switch means, said winding means having differently varying outputs with speed, and means correspondingly connecting said winding



means to said firing means such that one winding essentially controls the firing in one speed range and the other winding essentially controls the firing in a different speed range, and wherein said alternator charges the energy storage means during one polarity of a full cycle and actuate the firing means during the alternate opposite polarity of the cycle and said pair of winding means having a first winding providing a peak output at a first selected speed and a second winding providing a peak output at a second selected speed and establishing substantially in phase outputs under open circuit conditions and a trigger capacitor means connected to both said windings and selectively charged by the output of said windings in accordance with the speed of the engine to a selected level and then discharged into said switch means to fire said switch means.

3,890,949

TWIST TURBULENCE FORMING PASSAGE, ESPECIALLY IN THE INTAKE SYSTEM OF RECIPROCABLE INTERNAL COMBUSTION ENGINES

Ludwig Elsbett, and Gunter Elsbett, both of D 8543 Hilpoltstein, Germany

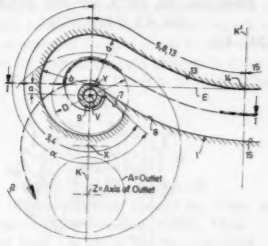
Filed July 16, 1973, Ser. No. 379,557

Claims priority, application Germany, July 17, 1972, 2235050

Int. Cl. F02f *1/42*

U.S. Cl. 123—188 M **11 Claims**

1. In combination with an internal combustion engine having a cylinder, a cylindrical gas inlet passage having an opening at one end located axially into one end of the cylinder and adapted for being closed at the cylinder end, a helical channel having one end in communication with the passage, a valve having an actuating stem coaxial with the cylindrical gas inlet passage, said cylinder having cylinder means for slidably receiving the valve stem and disposed near the other end of the cylindrical gas inlet passage and rising from said other end of said cylindrical gas inlet passage to the other end of said helical channel, and a supply channel for supplying gas to said helical channel and having one end connected to said other end of said helical channel and the other end adapted to recieve the gas to be supplied to said cylinder via said channels and passage, the axis of said helical channel being laterally offset from the axis of said cylindrical gas inlet passage and the



peripheral wall of said helical passage being a substantially uniform distance from the axis of said helical channel.

3,890,950

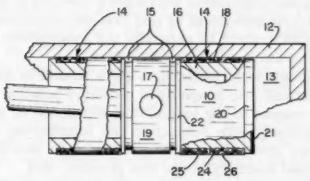
PISTON LUBRICATING

Charles W. Haldeman, Concord, Mass., assignor to Megatech Corporation, Billerica, Mass.

Filed Oct. 2, 1973, Ser. No. 402,708

Int. Cl. F02f *23/00*

U.S. Cl. 123—193 P **8 Claims**



1. Self-lubricating piston apparatus for a combustion engine comprising,

means defining a base piston structure having an external wall,

means defining a bearing surface layer for said structure bonded to said external wall and comprising a plastic matrix extending longitudinally along and over the full lateral extent of said base surface,

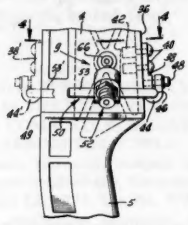
means defining a first strengthening reinforcement and lubricating phase distributed in said matrix comprising a plurality of elongated plastic impregnated yarn of ceramic fibers of lamellar crystal structure at an external surface of said layer running the full lateral extent of said bearing surface layer and parallel to each other,

means defining a second strengthening reinforcement and lubricating phase distributed throughout the longitudinal and lateral extent of said bearing surface layer comprising a dispersed particulated solid lubricant, and means defining heat transfer paths regularly distributed through said bearing surface layer for conducting heat from said external surface and said fibers through at least a portion of the thickness dimension of said bearing surface layer.

3,890,951
ADJUSTABLE ARROW REST

Thomas Paul Jennings, Sun Valley; John Monroe Williamson, Hollywood, and Carl Sumida, Los Angeles, all of Calif., assignors to Jennings Compound Bow, Inc., North Hollywood, Calif.

Filed Nov. 12, 1973, Ser. No. 414,863
Int. Cl. F41b *5/00*
U.S. Cl. 124—41 **12 Claims**



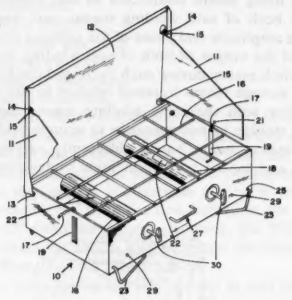
1. An adjustable arrow rest comprising:
an assembly including a sliding plunger having an arrow engaging tip and means to yieldingly bias the plunger for supporting engagement with the shaft of an arrow;
first means releasably attached to a second means for supporting said assembly at a position spaced from a bow;
second means adapted to be mounted on a bow operatively connected to said first means to permit movement of said first means and said assembly with respect to said second means in an upward or downward direction generally along the longitudinal dimension a bow and to also permit transverse movement of said first means and said assembly with respect to generally the longitudinal axis of a nocked arrow supported by a bow;
said second means including a quick release to fix said first means and said assembly in a desired position vertically with respect to the longitudinal dimension of a bow and transversely with respect to the longitudinal axis of a nocked arrow supported by a bow to fix said first means and said assembly in the new position, and
third means operatively connecting said assembly to said first means to releasably fix the angle of said assembly so as to vary the angle between the longitudinal axis of the plunger and the long dimension of a bow.

3,890,952
PORTABLE CAMPING STOVE

Mervin A. Hamre, 842 Cherokee Ave., St. Paul, Minn. 55107

Filed Oct. 15, 1973, Ser. No. 406,345
Int. Cl. F24c *5/06*
U.S. Cl. 126—45 **6 Claims**

1. A portable stove comprising:
a housing having side walls;
a plurality of burner assemblies mounted to said housing between two side walls, each of said burner assemblies comprising a first cylindrical chamber having first aperture means in one side, a second cylindrical chamber rotationally and axially movably mounted inside said first chamber and in intimate sealing contact therewith, said second chamber having second aperture means in one side;
a handle extending outside a side wall connected to an end of said second chamber so as to allow said second chamber to be moved to various positions having varying degrees of overlap between said aperture means; and
a fuel absorbent packing material in said second chamber adapted to be saturated with inflammable fuel, which fuel

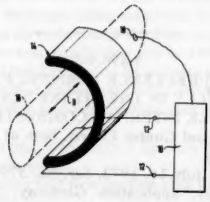


can be burned when exposed to the air by a suitable alignment of said aperture means.

3,890,953
ELECTRICAL APPARATUS GENERATING A LOW FREQUENCY, ALTERNATING MAGNETIC FIELD FOR PROMOTING THE GROWTH OF BONE AND OTHER BODY TISSUES

Werner Kraus, Munich, and Hans-Dieter Viehbach, Aisingerwies, both of Germany, assignors to Werner Kraus, Munich, Germany

Filed Apr. 6, 1972, Ser. No. 241,727
Claims priority, application Germany, Apr. 6, 1971, 2116869
Int. Cl. A61n *1/42*
U.S. Cl. 128—1.5 **5 Claims**

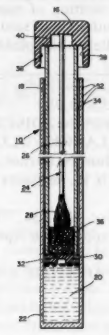


1. In an electrical apparatus for promoting the growth of bone and other body tissues by the application thereto of a low frequency alternating magnetic field, such apparatus having current generating means and field applicator means, the improvement wherein the applicator means comprises a flat solenoid coil having an axis about which the coil is wound and composed of a plurality of parallel and flexible windings, each said winding having two adjacent elongate portions and two 180° coil bends joining said elongate portions together, said coil being flexible in the coil plane in the region of said elongate portion for being bent into a U-shape, said coil being bent into such U-shape about an axis parallel to the coil axis and adapted for connection to a source of low frequency alternating current.

3,890,954
METHOD OF AND APPARATUS FOR COLLECTING CULTURES

Donald J. Greenspan, Riverside, N.J., assignor to U.S. Medical Research & Development, Inc., Riverside, N.J.

Filed May 8, 1973, Ser. No. 358,350
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 W **11 Claims**

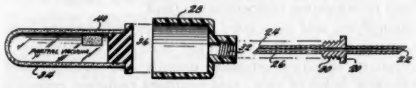


1. An apparatus for collecting cultures including an elongated member having an absorbent swabbing tip received within a container tube having an open end, a closed end and sides therebetween, a culture-sustaining liquid at the closed end of the tube, the improvement comprising plug means within said tube adjacent said culture-sustaining liquid, a portion of said plug means extending outwardly toward the sides of said tube in resilient contact therewith so as to form a sliding, substantially liquid-tight junction with the sides of said tube, said plug means including a resilient isolating valve member closing an opening in said plug means, said resilient isolating valve member being closed when said plug means is stationary within said tube so as to create substantial physical isolation of the swab within the tube from the culture-sustaining liquid when the plug means is located above the culture-sustaining liquid, said resilient isolating valve member opening in response to movement of said plug means toward the bottom of said tube through said culture-sustaining liquid so as to moisten said absorbent swabbing tip of said swab with said culture-sustaining liquid, said plug means having a surface adjacent said tip tapering radially inwardly toward said closed end for guiding the absorbent tip toward the center of said plug means to enable said elongated member to transmit a substantially axial force for moving said plug means through the culture-sustaining liquid.

3,890,955
VACUUM INDICATOR

John Elliott, Philadelphia, Pa., assignor to Angelika Elliott, Philadelphia, Pa.

Division of Ser. No. 228,687, Feb. 23, 1972, Pat. No. 3,800,780. This application Jan. 15, 1974, Ser. No. 433,561
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 F **5 Claims**

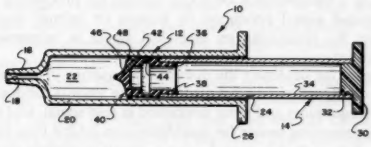


1. An apparatus for removing blood having a tube with at least partial vacuum pressure therein below atmospheric pressure and a needle connected to said tube with an end adapted for penetrating into a blood carrying body vessel and an interior blood transferring cavity so that, when said end has penetrated into a vessel, said cavity is in pneumatic connection with the interior of said tube and blood from that vessel is drawn through said cavity into the interior of said tube, the improvement comprising a quantity of hemoglobin painted on a portion of said tube, which has a color which varies as a function of the amount of oxygen about it, said material being within said tube for indicating by a change in color, a change in the amount of oxygen and the loss of said partial vacuum pressure.

3,890,956
BLOOD-GAS SAMPLER

Harvey Robert Moorehead, Salt Lake City, Utah, assignor to Deseret Pharmaceutical Co., Inc., Sandy, Utah

Filed June 27, 1974, Ser. No. 483,594
Int. Cl.² **A61B** *5/14;* **A61M** *5/315*
U.S. Cl. 128—2 F **7 Claims**



1. A blood-gas arterial syringe comprising:

a hollow barrel having means at the leading end for receiving an arterial needle, said means comprising a relatively small diameter port whereby blood is communicated from an artery to the hollow of the barrel, the barrel further comprising an intermediate portion having a relatively large essentially uniform inside diameter which opens at the trailing end of the barrel;

a plunger normally extending through the said opening and disposed along the intermediate portion of the barrel, the plunger comprising means at the trailing end for advancing the plunger into the barrel, and an intermediate section having a lateral dimension less than said inside diameter of the intermediate portion of the barrel;

the improvement comprising a seal comprising a cup-shaped body initially defining an essentially annular wall coaxial to but spaced from the inside surface of the intermediate portion of the barrel and an end closure comprising the leading end of the seal, the body being united at its trailing end to the leading end of the intermediate section of the plunger, the seal further comprising at least one radially extending annular seal bead spanning at all times between the annular wall and the inside surface of the intermediate portion of the barrel creating only limited resistance to plunger extension under force of arterial pressure, the seal further comprising a reduced thickness section of the annular wall located forward of said union between said trailing end of the seal and the leading end of the intermediate section of the plunger and creating an annular buckling region which is forced radially outward by fluid pressure creating an additional temporary annulus in sealing contact with the inside surface of the barrel as the plunger is advanced into the barrel causing blood within the barrel to be expelled through the small diameter port whereby blood leakage across the seal is alleviated, the temporary annulus collapsing to the initial configuration when the plunger is no longer advanced.

3,890,957

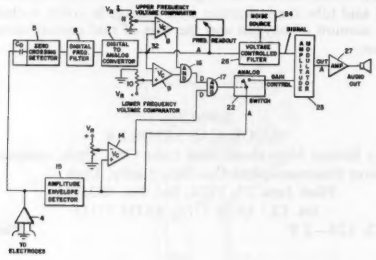
BIOLOGICAL FEEDBACK SYSTEMS

James A. Freeman, Berkeley, Calif., assignor to FSW Associates, Calif.

Continuation of Ser. No. 299,774, Oct. 24, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,288

Int. Cl. A61b 5/04

U.S. Cl. 128—2.1 B 12 Claims



1. In a bio-feedback device or system for processing a bio-generated signal produced by human or animal organism, means for generating an electrical signal in response to a bio-generated signal,

means for detecting the dominant frequency of said electrical signal, means for discriminating against subdominant frequenices and noise contained in said signal, said means comprising means for establishing an inhibit time interval after each detection having a duration slightly less than but approaching the periodicity interval being investigated for controlling the output of said detecting means so that the output thereof is inhibited during said time interval,

means for converting said detected dominant frequency to a signal the magnitude of which is proportional to said

indicator means for creating a signal which varies between conditions perceptible to said organism, and

means responsive to the magnitude of said analog signal for changing the indicated value of said indicator means.

3,890,958

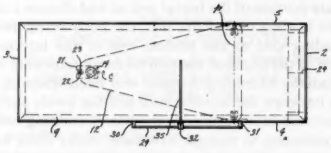
PHYSIOLOGICAL DIAGNOSTIC APPARATUS

Louis P. Fister, St. Louis, and Robert Paine, University City, both of Mo., assignors to Moog Automotive, Inc., St. Louis, Mo.

Filed Apr. 8, 1974, Ser. No. 459,108

Int. Cl.[2] A61B 5/10

U.S. Cl. 128—2 S 20 Claims



1. An apparatus for measurement of the extent of shifting of mass longitudinally within a patient's recumbent body resulting from visceral changes and changes of distribution of blood and extra-cellular body fluids comprising a flat platform dimensioned for receiving a patient's recumbent body thereon, said platform having opposed ends and side edges, a rigid support frame, rockable means mounting said platform on said frame for rockable movement about a pivot axis transversely of said platform, said rockable means inhibiting shiftable movement of said platform longitudinally and transversely and against lateral tilting, a load-actuated device provided beneath said platform and on one side of said pivot axis, said load-actuated device engaging the under face of said platform, signal processing means connected to said load-actuated device receiving signals therefrom and emitting output signals, means operatively provided with said signal processing means eliminating output signals caused by signals generated by said load-actuated device from the weight of said platform and from the weight of the patient's body, and means driven by said signal processing means for recording output signals developed by the shifting of mass within a patient's body in a direction longitudinally of said platform and within a plane substantially parallel to the plane of said platform.

3,890,959

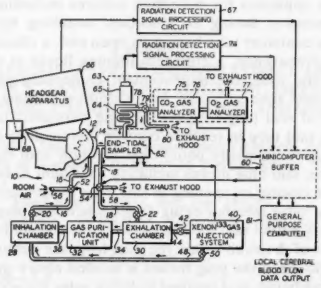
METHOD FOR DETERMINING DISCRETE LOCALIZED BLOOD FLOW IN A LARGE VOLUME OF TISSUE

Myron Youdin, Flushing; June N. Barker, and Theobald Reich, both of New York, all of N.Y., assignors to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 126,770, March 22, 1971, Pat. No. 3,769,966. This application Apr. 26, 1973, Ser. No. 354,489

Int. Cl. A61b 5/02, 6/00

U.S. Cl. 128—2.05 F 59 Claims



1. A method for determining a discrete localized blood flow in a preselected radiation emission detection zone of a volume of tissue comprising the steps of

a. defining a plurality of radiation emission detection zones for at least a portion of said tissue volume, said plurality of zones including said preselected zone;

b. defining a plurality of effective fields of view, each of said plurality of zones being within at least one effective field of view, each of said effective fields of view being defined with respect to an associated predetermined axis of view, each of said effective fields of view including said preselected zone and at least a portion of one or more of said other zones of said plurality of zones;

c. providing a source of radiation emission for said blood for causing each detection zone to have an associated quantity of radioisotope concentration and an associated quantity of radiation emission dependent on said associated radioisotope concentration; and

d. quantifying said associated quantity of radioisotope concentration for said preselected zone by quantifying a resultant radiation emission quantity for each of said effective fields of view, said resultant radiation emission quantities being dependent on said radioisotope concentrations of said preselected zone and said portions of said plurality of zones included within each of said effective fields of view, whereby said discrete localilzed blood flow may be determined.

3,890,960

MEDICAL DIAGNOSTIC INSPECTION SPATULA

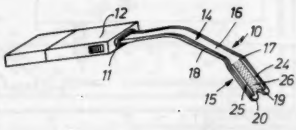
Friedgard Wunsch, nee Kuhn, and Erich Wunsch, both of Schwieberdingen, Germany, assignors to Efrudec-Vertriebsgesellschaft mbH fur Industrieprodukte aus Metall und Kunststoff, Schwieberdingen, Germany

Filed Dec. 13, 1973, Ser. No. 424,612

Claims priority, application Germany, Jan. 19, 1973, 2302614

Int. Cl. A61b 1/06

U.S. Cl. 128—16 13 Claims



1. A spatula, particularly for the diagnostic inspection of the mouth and throat, comprising an elongated body portion having an upper and a lower surface, two opposite end portions and a central portion located intermediate of the latter, one of said end portions being adapted to be received into the mouth cavity; a pair of transversely spaced skids provided at said one end portion and extending downwardly of said lower surface, whereby said skids only contact the rear part of the tongue and do not contact the base area of the tongue upon insertion of said one end portion into the mouth cavity; and groove-shaped recesses formed in said upper surface of said one end portion in the region of said skids and extending substantially longitudinally along the length of said skids.

3,890,961

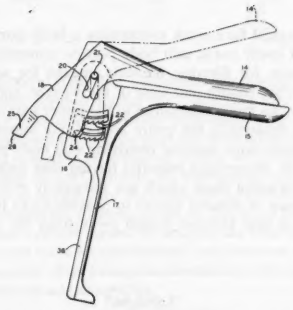
DISPOSABLE VAGINAL SPECULUM

William C. Moore, Skaneateles; John D. Connors, Auburn, and Richard W. Newman, Marcellus, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,695

Int. Cl. A61b 1/32

U.S. Cl. 128—17 6 Claims



1. A vaginal speculum comprising a pair of separable blades of resilient material fastened together by a pin and slot connection to permit relative pivotal and spatial adjustment of the blades, the pivotal adjustment permitting the blades to be moved between closed and various degrees of open positions, one of the blades having a double row of ratchet teeth positioned one above the other and the other blade having a pawl selectively engageable with the teeth in either of said rows, and means to enable the pawl to be moved from one row to the other while the blades are in an open position.

3,890,962

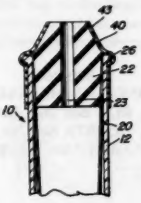
DISPOSABLE MANOMETER

Maynard Ramsey, III, Durham, N.C., assignor to Ramtech, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 84,718, Oct. 28, 1970, Pat. No. 3,720,211, which is a continuation-in-part of Ser. No. 881,121, Dec. 1, 1969, Pat. No. 3,648,687. This application Mar. 5, 1973, Ser. No. 338,283

Int. Cl. A61b 5/02

U.S. Cl. 128—2.05 D 6 Claims



1. A disposable blood pressure monitor comprising an elongated tubular structure, means on one end of said tubular structure adapted to place the interior of said tubular structure in direct communication with the blood pressure system to be monitored with the other end terminating in a lip configuration, a flexible sacklike membrane received within the lip end of the tubular structure, said sacklike membrane separating said tubular structure into first and second chambers, adapted to transmit pressure of the blood pressure system to be monitored and a one-hole stopper frictionally engaging the inner surface of said tubular structure with the peripheral edge of said sacklike membrane being sealingly positioned between the inner surface of said tubular structure and the outer surface of said stopper, a cover member made of heat, shrinkable material placed over the outer surface, of said stopper and the outer surface of said tubular structure and shrunk over the top and sides of said stopper to hold said stopper and tubular structure is a fixed relationship to prevent accidental dislodging thereof said heat shrinkable material when shrunk defining an aperture over the hole of said one hole stopper so that pressure indicating means can be detachably and sealingly received within the hole of said one hole stopper without rupturing said heat shrinkable material.

3,890,963

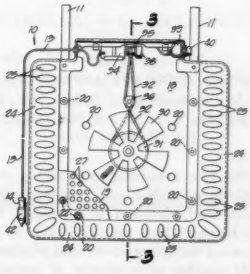
KINESTHERAPY DEVICE

John W. Patterson, 1528 1/2 Beverly Dr., Los Angeles, Calif. 90035

Filed Feb. 1, 1974, Ser. No. 438,674

Int. Cl. A61h 29/00

U.S. Cl. 128—24.1 7 Claims



1. A kinestherapy device having a relatively thin hollow main body adapted to be placed against the back or beneath

the buttocks, said main body having wide area base and cover plates interconnected by a flexible peripheral member and provided with a multiplicity of widely distributed air inlet and outlet openings, a motor driven air circulating means mounted within said main body operable to circulate air through said widely distributed openings and against a person resting against said cover plate, said motor driven means including means powered by said motor for vibrating said main body, service cord means extending between said motor and a source of electrical energy, and manually operable speed control means in circuit with said motor and said service cord means.

3,890,964

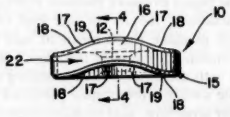
TONGUE CLEANING AND MASSAGE INSTRUMENT

Edwin W. Castanedo, Rt. 1 Box 265, Keithville, La. 71047

Filed Dec. 28, 1973, Ser. No. 429,158

Int. Cl.[2] A61H *7/00;* **A61B** *17/22*

U.S. Cl. 128—62 R **2 Claims**



1. A tongue massaging and conditioning instrument for enhancing the circulation through the tongue and freeing the papillae of the dorsal mucosa of pathogenic foreign matter potentially hazardous to health and destructive of the teeth comprising an elongated handle portion terminating at one end in a pair of longitudinally divergent arms mounting at their spaced ends a transversely directed, centrally arched, cross-bar substantially in the plane of said handle and arms, the opposite ends of said cross-bar comprise reversely curved (merge through reversed) arcuate segments merging into the divergent arm ends and thereby forming along one edge a centered convex portion adapted, when said instrument is held to position said one edge against the tongue and drawn forwardly along the tongue, to cooperate with the depressed medial area of the tongue and forming along the opposed edge respective laterally outwardly and downwardly sloping end portions adapted, when said instrument is held to position said opposed edge against the tongue and drawn forwardly along the tongue, to cooperate with the areas of the tongue laterally related to the depressed medial area, said one edge and said opposed edge being bevelled in a direction such that they intersect the inner wall of the cross-bar at an angle less than 90°.

3,890,965

HYDROTHERAPY APPARATUS

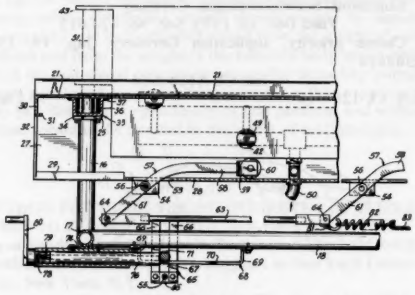
Marie Drew, 636 Commonwealth, Bronx, N.Y. 10471

Filed May 8, 1974, Ser. No. 468,029

Int. Cl. A61h *9/00*

U.S. Cl. 128—66 **9 Claims**

1. A hydrotherapy apparatus comprising a horizontally extending platform provided with liquid drains, a support frame on which said platform is mounted, longitudinally spaced nozzles located along opposite sides of said platform and directed toward the space above said platform, means for connecting said nozzles to a source of pressurized liquid, means for adjusting the vertical levels of said nozzles comprising a mount member supporting a group of said nozzles along each side of said platform, and means for raising and lowering said mount members between depressed positions with said nozzles being below the level of said platform and raised



positions with said nozzles being above the level of said platform.

3,890,966

ANTI-FOG SURGICAL FACE MASK WITH SLITS

Gary Bertil Aspelin, Bridgewater Twp.; Richard Francis Caffrey, Maplewood, and William Lauer, Madison, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 1, 1973, Ser. No. 411,872

Int. Cl. A61b *19/00*

U.S. Cl. 128—146.2 **8 Claims**

1. A surgical face mask comprising a body portion having upper and lower parts, said body portion comprising a filtration medium for filtering bacteria, means for securing the mask over the mouth and nose of the wearer, and a sheet of air impervious material secured to the upper part of said body portion, substantially the entire area of one major surface of said air impervious material overlying said body portion, said sheet of air impervious material having slits defining downwardly extending flaps which are outwardly movable under the influence of exhaled breath to provide paths for directing the flow of said exhaled breath away from the eyes of the wearer.

3,890,967

BREATHING INDICATOR AND VENTILATOR

James O. Elam, Chicago, Ill., and Henning M. Ruben, Copenhagen, Denmark, assignors to James O. Elam, Chicago, Ill.

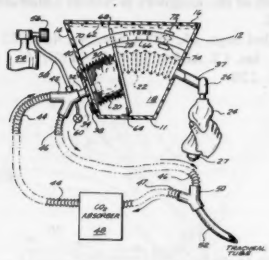
Filed Oct. 17, 1973, Ser. No. 407,218

Int. Cl. A61m *37/00*

U.S. Cl. 128—202 **15 Claims**

1. A breathing responsive device comprising a first bellows, a first conduit means for conducting a first quantity of gas between said first bellows and a patient, a second bellows, mounting means for mounting said first and second bellows in mechanically coupled relationship to one another, said second

bellows being pneumatically isolated from said first bellows, second conduit means for conducting a second quantity of gas



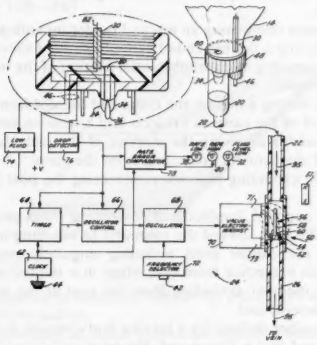
to said second bellows, and indicating means associated with said first bellows for indicating the relative extent thereof.

3,890,968

FLUID FLOW CONTROL MEANS

Oscar L. Pierce; Arthur H. Hutchison; Olin B. King, and Lonnie S. McMillian, all of Huntsville, Ala., assignors to SCI Systems, Inc., Huntsville, Ala.

Filed June 25, 1971, Ser. No. 156,854
Int. Cl. A61m *5/00*
U.S. Cl. 128—214 E **16 Claims**



1. A parenteral fluid flow controller comprising, in combination, closed conduit means for conveying said fluid to a patient, flow control valve means including a magnetic check valve enclosed within said conduit for controlling the flow of said fluid to said patient, actuating means including magnetic means outside of said conduit for repeatedly actuating said valve means to permit flow therethrough in increments, drop formation means for forming drops of said fluid from a fluid reservoir, and control means for making the time duration of opening of said valve means inversely proportional to the time rate of formation of said drops at substantially all times during the operation of said controller.

3,890,969

CARDIOPULMONARY BYPASS SYSTEM

Halbert Fischel, Santa Ana, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Jan. 21, 1974, Ser. No. 435,223
Int. Cl.[2] A61M *01/03*
U.S. Cl. 128—214 R **8 Claims**

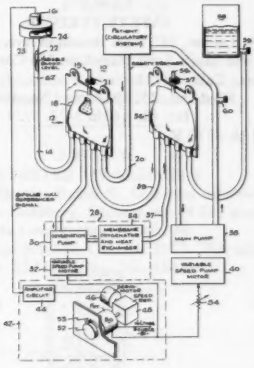
1. A cardiopulmonary bypass system for receiving a variable rate gravity fed venous blood flow from a human circulatory system, revitalizing the blood and returning the blood to the circulatory system at a flow rate substantially equal to the gravity fed blood flow comprising:

a first collapsible bag disposable below a withdrawal point coupled to receive a gravity fed flow of blood at an inlet, the collapsible bag being at least partially filled with blood and substantially without a blood-gas interface, the collapsible bag having a sufficient flexibility such that a collapse of the bag resulting from an emptying of blood therein inhibits a suction from occurring at the inlet;

a second collapsible bag;

recirculation path means for communicating blood from the second collapsible bag to the first collapsible bag;

revitalization means coupled between the first and second collapsible bags for continuously oxygenating and warming blood from the first bag and transporting the oxygenated and warmed blood to the second bag;



main pump means coupled to the second bag for delivering a blood flow from the second bag to a human circulatory system at a rate controlled by a control signal applied thereto;

blood volume transducer means coupled to the first bag for providing a signal related to the blood volume in the first bag; and

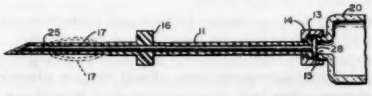
controller means responsive to the blood volume indication for supplying a control signal to the main pump means to drive the main pump means at a rate which tends to maintain the blood volume of the first bag at a predetermined level such that the return blood flow rate is held substantially equal to the venous blood flow.

3,890,970

RETENTION CANNULA OR CATHETER AND APPLICATOR

Robert L. Gullen, 3411 N. 5th Ave., Phoenix, Ariz. 85013

Filed Jan. 21, 1974, Ser. No. 434,963
Int. Cl. A61m *5/32*
U.S. Cl. 128—215 **2 Claims**



1. A cannula for penetration into and retention within soft body tissue, for injecting treating fluid into said tissue, comprising:

a. A flexible catheter tube of resilient plastic material having adjacent its forward end a thin membranous part expandable into a balloon structure and having a front end closed and formed in a point to fit over and be inserted into said tissue by a stylet, said catheter including openings therein positioned adjacent said closed end to permit transmission of treating fluids from said catheter to surrounding tissue;

b. A rigid stylet slideably mounted within said catheter and having its forward end formed into a point for supporting the pointed closed end of said flexible catheter during insertion in said tissue;

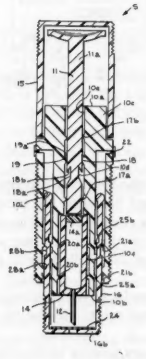
c. And means connected to said catheter for supplying treating fluid therethrough to said body tissue.

3,890,971

SAFETY SYRINGE

Thomas A. Leeson, 187 West Hamilton Ave., Campbell, Calif. 95008, and Mark Scott Hamilton, 556 Commercial St., San Francisco, Calif. 94111

Filed Oct. 23, 1973, Ser. No. 408,515
Int. Cl. A61m *5/22, 5/24*
U.S. Cl. 128—218 R **7 Claims**



1. A lockable safety syringe, comprising:

a barrel housing having a bore therethrough, said barrel housing bore being adapted at one end thereof to receive a container for medicine having a needle mounted therewith for protrusion outwardly from said barrel housing;

a plunger mounted in said barrel housing bore at the other end thereof for slidable movement, said plunger being movable into said container for medicine for displacing medicine in said container outwardly through said needle; a protective cap mounted on said one end of said barrel housing over said needle;

cap safety lock means for locking said protective cap over said needle to prevent reuse of said syringe; and

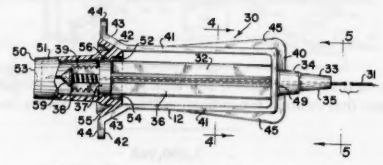
plunger safety lock means for locking said plunger against movement to prevent reuse of said plunger whereby said plunger safety lock means cooperates with said cap safety lock means to prevent reuse of said syringe, said cap safety lock means and said plunger safety lock means being located within said housing so as to be inaccessible after locking each of said means.

3,890,972

SYRINGE INJECTOR WITH POP-TOP CAP

Wendell Evert Standley, Lake Forest, and Glenn Lee Beall, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sept. 25, 1973, Ser. No. 400,573
Int. Cl. A61m *5/24; B65d 83/10*
U.S. Cl. 128—220 **7 Claims**



1. A medicament injector for receiving a vial having a stopper therein,

said injector comprising an integral holder including a solid post having a double-ended cannula molded therein, the post extending along a substantial portion of the length of the cannula,

said post having a hub on the distal end thereof from which one end of the cannula projects and a stem on the proximal end for receiving the stopper of the vial, the other end of the cannula projecting from the stem;

a laterally extending base interconnecting the post and the hub;

a pair of opposed, longitudinally extending wings projecting from the base toward the stem and terminating in finger grips, said finger grips including angularly projecting portions extending from said wings in a slanted manner; a stop member extending from the post at the proximal end thereof; and

a cap member defined by a tubular body portion having an open end and a closed end, the open end being defined by a base portion from which extends an obtusely slanted flange mating with the angularly projecting portion of the finger grips of said wings, said base portion adapted to engage the stop on the post and to be frictionally held on the post whereby said cap can be removed by applying pressure to the extending wings.

3,890,973

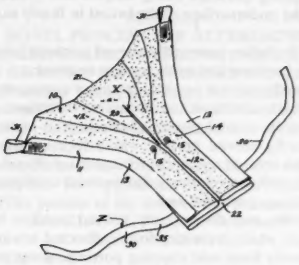
SANITARY DIAPER

Alwyn K. Davis, 483 Massey St., Thousand Oaks, Calif. 91360, and Ward A. St. John, 58 Farland Dr., Newbury Park, Calif. 91320

Filed June 29, 1973, Ser. No. 374,939
Int. Cl. A61f *5/44*
U.S. Cl. 128—286 **20 Claims**

1. A sanitary diaper having an inner absorbent layer and a contiguously overlying and impervious outer layer, and including a normally closed slit-shaped excrement diverting

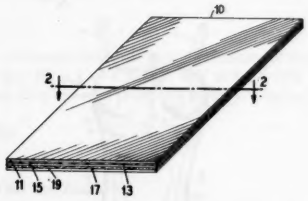
opening through the inner absorbent layer to be spread by and to pass fluid excrement from the interior to the exterior of the inner absorbent layer for containment within the confines of said impervious outer layer.



3,890,974
DISPOSABLE ABSORBENT ARTICLE CONTAINING SLITTED HYDROGEL FILM

Theodore F. Kozak, Peekskill, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 18, 1974, Ser. No. 480,523
Int. Cl. A41b *13/02*
U.S. Cl. 128—287 **11 Claims**



1. A disposable absorbent article for placement adjacent to the body, including:

a. a hydrophobic liquid permeable topsheet for placement adjacent to the body;

b. a liquid impermeable backsheet; and

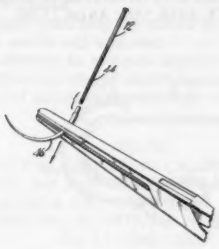
c. a hydrophilic, substantially water insoluble film disposed between said topsheet and said backsheet, said film containing a plurality of slits of from about 1/6 to ⅝ inch in length, whereby liquid contacting said film causes the film to swell thereby opening said slits to permit passage of liquid therethrough.

3,890,975
CONTROLLED RELEASE SUTURE

Walter McGregor, Somerset, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 258,159, May 31, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 409,974
Int. Cl. A61b *17/06*
U.S. Cl. 128—339 **13 Claims**

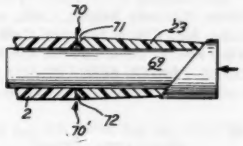
1. A needle-suture combination comprising a needle having a sharp end and a blunt end and having an opening in said blunt end; and a suture one end of which is coated with a resin and of smaller diameter than the remainder of the suture, said resin-coated end being received within said opening with the remainder of said suture extending outwardly of said blunt end, said blunt end of said needle being swaged to the extent that the resin-coated end of said suture is compressed to from about 62% to about 75% of its original diameter and said needle-suture combination is characterized by a suture pull-out value of from about 3 to about 26 ounces.



3,890,976
CATHETER TIP ASSEMBLY

Seymour Bazell, Skokie; Ralph G. Ostensen, Morton Grove, and Edward M. Goldberg, Glencoe, all of Ill., assignors to Medical Products Corporation, Skokie, Ill.

Division of Ser. No. 301,172, Oct. 26, 1972. This application Jan. 21, 1974, Ser. No. 434,937
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 **4 Claims**



1. An improved tracheal tube comprising:

a. a flexible, tubular body portion with a durometer of above 60 to about 85 having a central passage extending axially therein from a proximal to a distal end;

b. an inflatable cuff positioned on the tubular body portion;

c. means for inflating said cuff;

d. a separate molded tip secured to the distal end of the flexible tubular body portion,

i. said tip having a distal portion and having an aperture therein communicating with the central passage of said tube body portion,

ii. said tip being resilient material having a durometer higher than the durometer of said flexible tube body portion, and in the range of from about 75 to about 95,

iii. said distal portion having a distally extending inward taper and a chamfered leading edge of uniform thickness around its entire circumference oriented transverse to the axis of the aperture for ease of insertion into a body, and

iv. said tip also having a proximal portion with an inwardly beveled edge abutting and heat sealed to the distal end of said tube body portion,

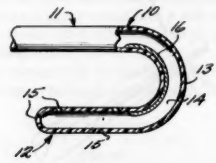
v. said heat seal providing a smooth transition between the tubular body portion and the tip on both the exterior and the interior thereof;

e. said tip providing a tracheal tube wherein the tip does not fold over upon striking an obstruction when inserted into the body.

3,890,977
KINETIC MEMORY ELECTRODES, CATHETERS AND CANNULAE

Bruce C. Wilson, 34 Twickwood Ln., Glens Falls, N.Y. 12801

Filed Mar. 1, 1974, Ser. No. 447,340
Int. Cl. A61b 5/02; A61m 25/00
U.S. Cl. 128—418 15 Claims

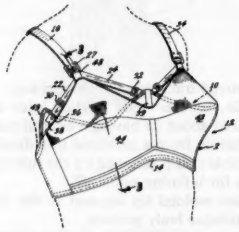


1. A catheter comprising
a. an elongated generally cylindrical body member having a proximate and a distal end, said distal end for insertion into a body,
b. a distal portion of said body member capable of assuming a shape for ready insertion into a body, and a different shape for proper location in a body, and
c. means for shifting said distal portion from said readily insertable shape to said different properly locating shape upon bringing said portion to a specified temperature, said means comprising at least a portion of transitional temperature activated mechanical memory material formed into said distal portion.

3,890,978
BRASSIERE CONSTRUCTION

Mulford J. Nobbs, Hacienda Heights, Calif., assignor to Con-Stan Industries, Inc., City of Industry, Calif.

Filed Feb. 1, 1974, Ser. No. 438,868
Int. Cl. A41c 3/00
U.S. Cl. 128—485 9 Claims

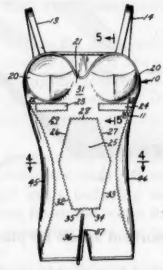


1. In a brassiere construction having an outer covering with breast covering cups, said covering encircling the body of the wearer, and an inner breast supporting band which contacts the undersurfaces of the wearer's breasts in providing support to the breasts, the improvement comprising:
said band having a permanent compound three-dimensional curvature to correspond with the three-dimensional curvature of the undersurfaces of the supported breasts;
said band being breathable so as to permit the flow of air to the supported breast areas and to promote the removal of moisture from said band and from the supported breast areas;
said band including rib cage portions having a transverse curvature to correspond with the transverse curvature of the wearer's rib cage;
said rib cage portions being relatively flat in a vertical direction to correspond to the generally fat configuration of the rib cage in a vertical direction;
said band including cupping portions which are curved upwardly, outwardly and transversely to a three-dimensional compound curvature corresponding to the three-dimensional curvature of the undersurface of the breast;
said cupping portions being shaped and positioned to cradle the undersurface of the breast in firmly supporting the breast;
said band including outwardly curved portions joining said rib cage portions and said cupping portions;
said outwardly curved portions having a compound curvature in both a vertical and transverse direction;
said outwardly curved portions including an inwardly and downwardly curved portion which forms a merger between the upward and outward curvature of said cupping portions and the relatively flat vertical configuration of said rib cage portions, and
said inwardly and downwardly curved portion having a curvature which transmits forces directed inwardly and downwardly from said cupping portions along an unbroken curved path into the substantially flat vertical configuration of said rib cage portions such that the downwardly and inwardly directed forces conveyed through said cupping portions are received by said rib cage portions without the formation of wrinkles in said band.

3,890,979
REINFORCED FOUNDATION CONSTRUCTION

Jeannette I. Fierst, 2 Weybridge Rd., Great Neck, N.Y. 11023

Filed Nov. 5, 1973, Ser. No. 412,876
Int. Cl. A41c 1/00
U.S. Cl. 128—555 7 Claims



1. In a control foundation garment, including a tubular main body element formed of spandex yarn and having a given modulus of elasticity in each of two mutually perpendicular directions, the improvement comprising: a plurality of reinforced areas formed by the securing of elastic panels having modulus of elasticity in each of said two mutually perpendicular directions of at least three times that of the modulus of elasticity of said main body element in each of said directions, in areas requiring control.

3,890,980
METHOD FOR PREVENTING THE ESCAPE OF TOBACCO CRUMBS OR DETRITUS AT THE ENDS OF CIGARETTES IN TRANSPARENT PACKAGES

Erwin Helmut Geldmacher, Im Haag 472, Niederteuffen, Aargan, Switzerland

Filed June 19, 1972, Ser. No. 264,364
Claims priority, application Germany, June 24, 1971, 2131460; June 24, 1971, 2131459; June 24, 1971, 2131458
Int. Cl. A24c 05/60
U.S. Cl. 131—121 1 Claim

1. A method for preventing the emergence of tobacco particles from cigarettes to be packaged comprising the step of

heating only the cigarette end to effect a rapid heating by microwave heating sufficiently to coagulate the proteins in the tobacco to seal the end thereof against the escape of detritus.

3,890,981

NOVEL PROCESS FOR ALTERING THE ORGANOLEPTIC PROPERTIES OF TOBACCO USING ONE OR MORE ALPHA-PYRONES AND PROCESS

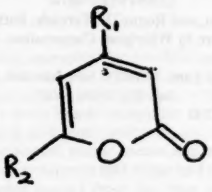
Joaquin Francisco Vinals, Red Bank, N.J.; Alton Dewitt Quinn, Abrahamsville, Pa., and Alan Owen Pittet, Atlantic Highlands, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 471,785, May 20, 1974, Pat. No. 3,861,403. This application Sept. 4, 1974, Ser. No. 503,110The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl. A24b *15/04*

U.S. Cl. 131—144 **6 Claims**

1. A process for altering the organoleptic properties of tobacco comprising the step of adding to tobacco a tobacco flavoring composition comprising one or more 6-alkyl-alpha-pyrone compounds having the structure:



wherein R_1 is selected from the group consisting of methyl and hydrogen, and R_2 is C_3—C_5 alkyl and at least one tobacco flavoring additive selected from the group consisting of:

Esters;
Aldehydes;
Ketones;
Acetals;
Natural Oils and Extracts;
Lactones,
Ethers;
Pyrazines; and
Pyrroles

3,890,982

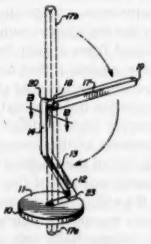
PIPE SMOKERS' FOLDING COMBINATION TOOL

Bernard C. Bruget, 313 E. Catalina, Yarnell, Ariz. 85012

Filed Oct. 15, 1974, Ser. No. 514,597

Int. Cl.² A24F *09/04*

U.S. Cl. 131—243 **1 Claim**



1. A pipe smoker's folding combination tool for tamping smoking tobacco within the bowl of a smoker's pipe, for aerating said tobacco, and for picking and cleaning the bowl and stem of said pipe, said tool comprising:

a. a disk sized to be inserted into a pipe bowl;
b. an arm extending from said disk generally perpendicular to a face thereof;
c. an elongate shaft hingedly affixed at one end thereof to the free end of said arm; and
d. means defining an elongate aperture extending radially inward from the edge of said disk and sized to receive the free end of said shaft therethrough.

3,890,983

METHOD FOR PREPARING CIGARETTE FILTER

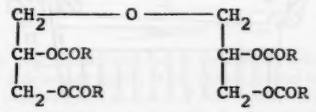
Hideo Sawada, and Junji Kawamoto, both of Sakai, Japan, assignors to Daicel, Ltd., Osaka, Japan

Filed Aug. 22, 1973, Ser. No. 389,083

Int. Cl. A24b *15/02*

U.S. Cl. 131—267 **7 Claims**

1. A tobacco smoke filter comprising a bundle of substantially longitudinally extending cellulose acetate fibers having a size of from 1 to 16 denier per fiber, said fibers being substantially uniformly coated with from 1 to 20% by weight, based on the weight of the fibers, of a plasticizer comprising as an ingredient a compound or a mixture of compounds having the formula:



wherein R is hydrogen or a lower alkyl group having one to four carbon atoms and at least two R are said lower alkyl groups.

3,890,984

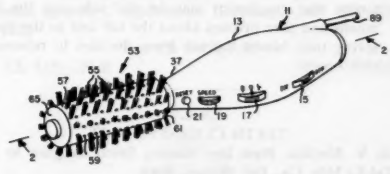
HAIR DRYER WITH ROTARY BRUSH

Alexander C. Lesetar, 1510 Lexington Dr., San Jose, Calif. 95117

Filed Jan. 23, 1974, Ser. No. 435,730

Int. Cl. A45d *20/00*

U.S. Cl. 132—9 **3 Claims**



1. A combination hair drying and rotary implement, comprising:

a hollow handle including therein a heater-fan unit and a motor;

a conduit non-rotatably mounted longitudinally adjacent one end of the handle and positioned to accept a flow of hot air from the heater-fan unit and guide the hot air so it does not contact the motor, the conduit having a longitudinal slot commencing adjacent the end of the conduit removed from the handle and terminating short of the handle, the slot serving to direct the hot air directionally outwardly through a limited angle from the slot; and

a brush comprising a tube having bristles extending from the external cylindrical surface thereof, the tube further having a plurality of openings therethrough adjacent the bristles, the tube rotatably communicating at one end thereof with the motor, the tube being substantially con-

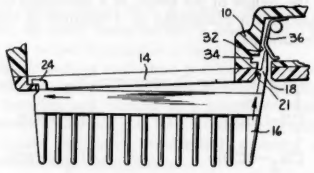
centric with the conduit and being adapted to fit externally around the conduit, said tube detachably communicating with said motor whereby a plurality of brushes are usable with a single handle, means within said handle for automatically stopping the rotation of said brush responsive to high resistance to rotation thereto as when hair becomes entangled in the bristles thereof, and, on said handle, means for selecting the direction of rotation of said brush, means for manually starting rotation of said brush after rotation has been stopped responsive to high resistance thereto, means for manually stopping rotation of said brush, and means for manually stopping and starting said heater-fan unit.

3,890,985

APPLIANCE ACCESSORY ATTACHMENT MEANS

William Robert Hicks, Spencerport, N.Y., assignor to General Electric Company, Bridgeport, Conn.

Filed May 15, 1974, Ser. No. 469,961
Int. Cl. A45d *1/00*
U.S. Cl. 132—9 **7 Claims**



1. In a personal care appliance, structure securing interchangeable styling attachments thereto comprising,
an elongated attachment with hook means at one end directed away therefrom,
a tab at the other end generally perpendicular to the hook having a projection spaced from the tab end,
slot means in said appliance receiving said hook means in sliding overlapping engagement,
a second slot within said appliance and a recess therein to engage the tab and projection respectively locking the attachment in place,
spring means in said second slot shaped to bias the tab into locking position,
whereby the attachment may be slid releasing the hook means and then pivoted about the tab end so the shaped spring then biases the tab from the slot to release the attachment.

3,890,986

TEETH CLEANING UNIT

Irvin V. Gerlich, West Des Moines, Iowa, assignor to Den-Tal-Ez Mfg. Co., Des Moines, Iowa

Continuation of Ser. No. 346,139, April 29, 1973. This application July 12, 1974, Ser. No. 487,834
Int. Cl. A65d *44/18*; **A61l** *17/02*
U.S. Cl. 132—84 A **5 Claims**

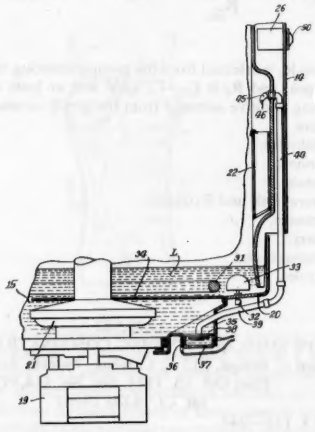
1. A teeth cleaning unit including in combination:
a. an elongated body member having a brush section and a hollow cylindrical handle section open at the outer end thereof,
b. a cap member for said open outer end including a head section and a stem section, said head section having an under surface and said stem section receivable within said handle section through said open outer end to a closing position defined by the engagement of said under surface with the terminal face of said handle section outer end,
c. said stem section having an axial groove and said under surface a radial groove relatively arranged to form a single continuous groove,
d. said head section having an outer surface formed with a radial groove located laterally opposite the radial groove in said under surface,
e. a flat cutter member embedded in the outer surface of said head section extended transversely of the radial groove in said outer surface, including a cutting section located at the inner end of said last mentioned radial groove, and
f. a spool of dental floss within said hollow handle section having a leading end extendible through said continuous groove, and the radial groove in said outer surface for travel over said cutting section.

3,890,987

WASHING APPARATUS WITH AUXILIARY DISTRIBUTOR

Henry Marcussen, and Rogue D. Marcade, both of Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 4, 1973, Ser. No. 366,370
Int. Cl. B08b *3/02*
U.S. Cl. 134—57 D **17 Claims**



1. A washing apparatus comprising: wall means defining a washing chamber having a lower sump; spray means for circulating washing liquid from a main body of washing liquid in said chamber sump against a first and a second group of objects to be washed disposed in said chamber and back to said sump; basket means for holding said second group of objects to be washed separate from said first group; collecting means for collecting a portion of the washing liquid from said sump during the circulation of the washing liquid; heating means for heating the collected portion of the washing liquid to a temperature higher than that of said main body in the chamber sump; and delivery means for delivering said portion of the washing liquid to substantially only said second group of objects in said basket means for high temperature washing of said second group of objects concurrently with the washing thereof by the washing liquid delivered by the spray means.

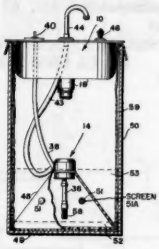
3,890,988
CLEANING ASSEMBLY FOR AUTOMOTIVE PARTS AND THE LIKE

Edward Lee, Winnipeg, Canada, assignor to Solv-X Inc., Rexdale, Canada

Continuation-in-part of Ser. No. 187,820, Oct. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 167,109, July 29, 1971, abandoned. This application July 13, 1973, Ser. No. 378,953

Int. Cl. B08b *3/02, 3/08;* **C23g** *5/04*

U.S. Cl. 134—111 **8 Claims**



4. In a cleaning assembly for machine parts and the like which includes a container, a parts cleaning receptacle situated on the upper side of said container, nozzle means in said receptacle and a drain in said receptacle discharging into said container, a pump and pump motor in said container operatively connected to said nozzle means and a pump intake on said pump; means to support said pump and pump motor, said pump intake being spaced from the base of said container, primary separator means in said container and relatively fine secondary filter means on said pump intake, said means to support said pump and pump motor also constituting said primary separator means, said primary separator means receiving solvent from said drain and directing said solvent to adjacent the outer walls of said container, said primary separator means and said means to support said pump and pump motor comprising a frusto-conical support supported on the base of said container, said pump and pump motor engaging within the open apex of said conical support, and solvent intake means formed in the walls of said conical support.

3,890,989
CANOPY SUPPORTING FRAME AND CANOPY

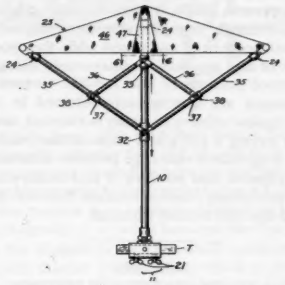
Benjamin Kuxhouse, 12203 16th Ave. South, and Russell R. Balzer, 1039 S. 146th St., both of Seattle, Wash. 98168

Filed Nov. 23, 1973, Ser. No. 418,543

Int. Cl. A45f *1/14*

U.S. Cl. 135—7.1 R **3 Claims**

1. A canopy supporting frame and canopy comprising two end frame assemblies of duplicate construction adapted to be supported in opposed, upright spaced apart relation when in use, each end frame assembly comprising an upright post, a lower sleeve and an upper sleeve each slidably movable on said post, means operable in releasably securing each sleeve in different adjusted positions on its post, two longer bow member supporting arms each having one end pivotally attached to the lower sleeve on each post, two shorter arms each having one end pivotally connected with the upper sleeve on each post and the other end pivotally connceted with one of the longer arms outwardly from the lower sleeve; a medial bow member supported by and extending between the upper ends of the two upright posts; two lateral bow members supported by said longer arms and extending between the outer ends of said longer arms and positioned parallel with and at opposite sides of said medial bow member, said medial bow member and each of said lateral bow members terminating at each end in a rigidly attached short end part which is substantially perpendicular to the main part of the bow member; a hinge pivotally connecting the shorter end part of said medial bow member with the upper end of one of said posts; other hinges pivotally connecting the short end parts at each end of each of the two lateral bow members with the outer end of one of said longer arms, the pivotal connection of the longer and shorter arms with each other and with said slidable and adjustable sleeves providing for the folding of said longer and shorter arms alongside of said posts and the hinges connecting the short terminal end parts of the medial bow member and the lateral bow members with the upper ends of the posts and



the outer ends of the longer arms respectively providing for ninety degree inward folding of the end assemblies parrallel to the bow members; and a canopy of pliable material extending over said medial bow member and having opposite edges secured to the respective lateral bow members, the two adjustable sleeves on each post in cooperation with the shorter arms which connect each upper sleeve with two longer arms providing for movement of said longer arms in adjusting the pitch and tension of the areas of canopy on opposite sides of the medial bow member while always maintaining said two areas equal.

3,890,990
UMBRELLA FRAME

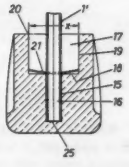
Josef Schafer, Solingen, Germany, assignor to Telesco Brophey Limited, Montreal, Canada

Filed July 7, 1972, Ser. No. 269,909

Claims priority, application Germany, July 10, 1971, 2134625

Int. Cl. A45b *9/02*

U.S. Cl. 135—20 R **2 Claims**



1. In an umbrella assembly for preventing relative movement between two elements comprising in combination a rod-like element a second element including a bore portion telescopically receiving one end of said rod-like element; and fastening means engaged between said elements and retaining them in assembled relation, the improvement in which said assembly fastening means comprises:

a flat elongated, normally resilient plate element having a transverse aperture through which said rod-like element extends, said flat element being bowed under compression longitudinally intermediate its length about a trans-

verse axis passing through said transverse aperture and having single opposed edge portions of said aperture continuously and bitingly engaging opposed portions of said rod-like element, said plate being freely slidable along said rod-like element when in a flat unbowed condition, said second element having an axial recess surrounding said bore portion and said rod-like element with side walls projecting parallel to and uniformly from and defining a shoulder normal to said bore and recess, said recess having a longitudinal dimension less than a corresponding longitudinal dimension of said plate in the direction it is bowed, said plate being spring-bowed into said recess and having opposed, single transverse outer edges continuously and bitingly engaged with transverse adjacent opposed wall portions of said recess while the opposed edge portions of said aperture simultaneously bitingly engage the opposed portions of said rod-like element whereby the elements are continuously retained in assembled relation against relative or rotary movement, said rod-like element having a polygonal cross-section, said plate including longitudinal side edge portions substantially parallel to adjacent side portions of said recess side wall for further preventing relative rotation between the assembled rod-like and second elements.

3,890,991

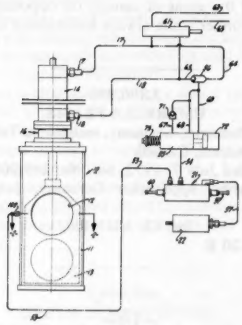
VALVE APPARATUS AND METHOD

Marvin H. Grove, and Rodney A. Wailes, both of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.

Division of Ser. No. 244,398, April 17, 1972, which is a continuation of Ser. No. 162,806, July 15, 1971, abandoned. This application July 2, 1973, Ser. No. 375,846

Int. Cl. F16k *23/00*

U.S. Cl. 137—1 **1 Claim**



1. A valve method making use of a valve consisting of a body having aligned flow passages, a valve member within the body and movable between open and closed positions relative to the flow passages, at least one seat ring movably carried by the body and surrounding one of the flow passages, and means within the valve adapted to receive hydraulic fluid under pressure for jacking the ring against the valve member, the method comprising continuously directing hydraulic fluid under a predetermined substantially constant pressure from a separate external source of predetermined constant pressure to said last means when the valve is in closed position, and then when it is desired to operate the valve, overcoming such hydraulic fluid pressure applied to said lastnamed means by opposing the pressure from said source with a counter pressure applied between said source and said last-named means, to cause the thrust of the seat ring against the valve member to be substantially reduced.

3,890,992

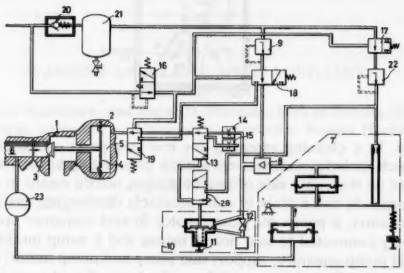
METHOD AND APPARATUS FOR SAFEGUARDING PIPE-LINES AGAINST AN INADMISSIBLY HIGH INTERNAL COMPRESSIVE LOAD BY A CONTROL VALVE WITH A PNEUMATIC DRIVE

Werner Wolz; Hans Bender, both of Mannheim, and Manfred Schmitt, Bobenheim-Roxheim, all of Germany, assignors to Fa. Gulde-Regelarmaturen KG, 67 Ludwigshafen-Oggersheim, Germany

Filed Sept. 27, 1973, Ser. No. 401,500

Int. Cl. G05d *7/06*

U.S. Cl. 137—14 **6 Claims**



1. A method for safeguarding a pipe-line against an inadmissibly high internal pressure and an inadmissibly large rate of pressure increase, comprising the following steps:

a. generating a first, pressure, signal as a function of the momentary pressure in said pipe-line;

b. continuously applying said first pressure signal to a pressure ratio regulator for generating, at an output of the pressure ratio regulator, a second signal as a function of said first signal;

c. applying a presettable constant pneumatic pressure to the power input of a power amplifier;

d. applying said second signal to the control input of said power amplifier for generating a third, pneumatic pressure, signal at the output of said power amplifier, said third pressure signal being a function of said second signal;

e. applying said third signal to a drive chamber of a regulator valve connected to said pipe-line; the pressure in said drive chamber opposing the valve opening pressure constituted by the internal pressure in said pipe-line, whereby an increase of the internal pressure in the pipe-line causes an increase of pressure in said drive chamber until the pressure in said drive chamber reaches a threshold value set for said presettable constant pneumatic pressure, and whereby said internal pressure, upon exceeding said threshold value, causes opening of said regulator valve;

f. differentiating said third signal with respect to time to obtain a pressure differential characterizing the rate of pressure change in the pipe-line;

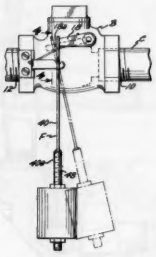
g. comparing said pressure differential with a reference value; and

h. depressurizing said drive chamber if said pressure differential exceeds said reference value, whereby said regulator valve is opened by said internal pressure.

3,890,993
EARTHQUAKE ACTUATED FLUID FLOW OBSTRUCTING DEVICE

George C. MacNeilage, 9471 Cape Cod Dr., Huntington Beach, Calif. 92646

Filed Jan. 2, 1974, Ser. No. 430,164
Int. Cl. F16k 17/36
U.S. Cl. 137—45 4 Claims



1. In combination with a tubular member that has a first end through which fluid enters to flow through said tubular member, a device for terminating the flow of said fluid through said tubular member when said device is subjected to an earthquake shock of greater than a predetermined magnitude, said device including:

a. a hollow valve body having first and second spaced openings therein, with said body including an internal seat adjacent said first opening, said first end of said tubular member connected to said first opening in said tubular member, and said fluid being supplied to said tubular member through said second opening in said body;

b. a transverse shaft rotatably and sealingly supported in said body, said shaft having a first end portion that projects from said body;

c. a valve member pivotally movable in said body, and rigidly secured to said shaft, said valve member normally occupying a first position to permit fluid to flow through said body to said tubular member, but said valve member capable of occupying a second position in which it is in sealing contact with said seat to prevent fluid from flowing through said body to said first tubular member;

d. a first arm secured to said first end portion of said shaft and normally disposed thereto, said arm having an outer end portion;

e. spring means that at all times tend to pivot said arm, shaft and valve member in a direction to dispose said valve member in said second position;

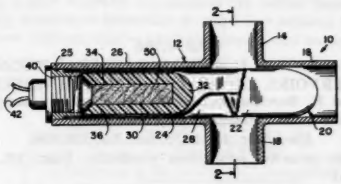
f. a second arm rigidly secured to said body, said second arm including an outer end portion adjacently disposed to said outer end portion of said first arm when said valve member is in said first position; and

g. a pendulum assembly pivotally supported from said second arm and capable of pivoting both longitudinally and transversely relative to said body when said device is subjected to an earthquake shock, with said assembly removably engaging said outer end portion of said arm to maintain said valve member in said first position, and said pendulum assembly when subjected to an earthquake shock above a predetermined magnitude pivoting either longitudinally or transversely relative to said body to become disengaged from said outer end portion of said first arm to allow said spring means to pivot said first arm, shaft and valve member to dispose said valve member in said second position where it will so remain until said first arm, shaft and valve member are manually pivoted to dispose said valve member in said first position and said pendulum assembly in engagement with said outer end portion of said first arm.

3,890,994
NORMALLY OPEN VALVE CONSTRUCTION HAVING A DEFORMABLE BLADDER

Charles R. Olsen, Box 851, West Chester, Pa. 19355

Filed Aug. 20, 1973, Ser. No. 390,075
Int. Cl. F16k 7/02, 7/10; F16l 55/12
U.S. Cl. 137—67 17 Claims



1. A normally open valve for a fluid system comprising:

a valve housing defining first and second fluid ports and a fluid passageway extending between the ports;

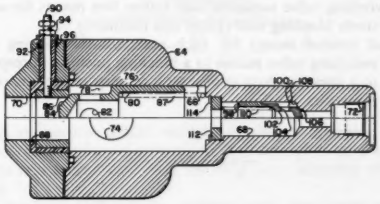
a deformable metallic bladder mounted in the valve housing with one portion in a crushed condition projecting into the passageway at a station between the first and second ports, the bladder in the uncrushed condition having an elongated tubular configuration which is closed at one end and forms an opening at the opposite end and having a tube wall defining a tube cross-section completely filling the fluid passageway at said station, and in the crushed condition having the tube wall in the crushed portion substantially collapsed upon itself whereby the fluid passageway is not fully obstructed between the ports and

means mounted in the opposite end of the metallic bladder for movement through the bladder and for deforming the collapsed tube wall outwardly in the fluid passageway of the valve housing to close the passageway between the ports.

3,890,995
FLOW-SENSING SWITCH FOR BACKUP STEERING SYSTEM

Wayne Russel Miller, Dubuque, and Robert James Lucke, Jr., Bellevue, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 1, 1974, Ser. No. 465,836
Int. Cl. F16k 15/00; F15b 20/00
U.S. Cl. 137—113 5 Claims



1. A flow-sensing valve having components acting as electrical switch means for completing a circuit in response to a preselected flow condition, comprising: a valve body defining a valve bore; an inlet and an outlet port connected to the bore at axially spaced locations; an electrical conductive means extending through the valve body and including a valve seat located in the bore between the inlet and outlet; electrical insulating means surrounding the electrical conductive means for fixing the latter and insulating it from the valve body; a valve element axially shiftably mounted in the bore and having a seating surface located for engagement with said valve seat; axially yieldable means normally biasing said valve element to

a closed position wherein the seating surface thereof engages said valve seat; and said yieldable means being responsive to a predetermined pressure at said inlet port to yield axially so as to allow the valve element to shift to an open position wherein the inlet and outlet ports are in fluid communication.

3,890,996

INSTALLATION FOR FILLING SEVERAL PRESSURE RESERVOIRS, ESPECIALLY IN MOTOR VEHICLES

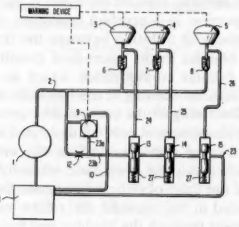
Manfred H. Burckhardt, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 12, 1973, Ser. No. 339,990

Claims priority, application Germany, Mar. 10, 1972, 2211561

Int. Cl. G05d *11/02*

U.S. Cl. 137—119 **41 Claims**



1. An installation for filling a plurality of fluid pressure reservoirs which supply different pressure cycles associated with automotive vehicle operations and the like; said installation comprising:

common filling pipe means leading to all of said reservoirs by way of a check valve means between each reservoir and said filling pipe means,

storage tank means,

pump means for pumping fluid from said storage tank means to said filling pipe means,

return line means connected between said filling pipe means and said storage tank means,

switching valve means in said return line means for selectively blocking said return line means,

and control means for each reservoir for moving said switching valve means to a blocking position in response to a pressure drop in at least a corresponding one of the reservoirs.

3,890,997

AUTOMATIC PRESSURE-CONTROL VALVE, ESPECIALLY FOR A PRESSURIZED-GAS SUPPLY INSTALLATION

Helmut Dresler, Trostberg, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Mar. 2, 1973, Ser. No. 337,764

Claims priority, application Germany, Mar. 3, 1972, 2210362

Int. Cl. F16k *51/00*

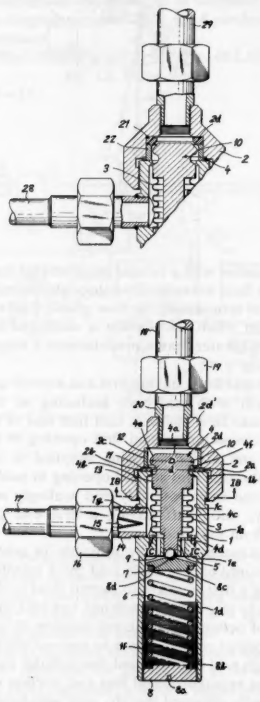
U.S. Cl. 137—271 **5 Claims**

1. A pressure-control comprising:

a valve body having two housing parts connected together and defining an elongated valve chamber, said body being formed with at least two longitudinally spaced-apart ports communicating with said chamber;

a poppet-type valve member linearly displaceable in said chamber longitudinally thereof and having a doubly-conical valve head defining a pair of oppositely converging sealing surfaces;

a seating ring of deformable polytetrafluorethylene clamped in said body between said housing parts and engageable with a selected one of said sealing surfaces upon displacement of said valve member and positioned interchangeably with a seating ring engageable with the other valve surface thereof;



a spring received in said body and acting upon said valve member to bias the latter in one linear direction against a fluid-pressure differential applied to said head, said valve forming a pressure-buildup controller upon insertion of one of said rings into said body and a pressure-drop controller upon introduction of the other of said rings into said body; and

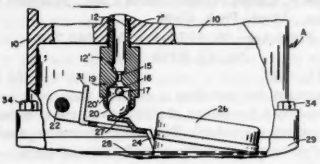
a spacer sleeve in said body and bearing axially upon said ring, said sleeve being axially engaged by one of said housing parts and urging said ring annularly against the other housing part;

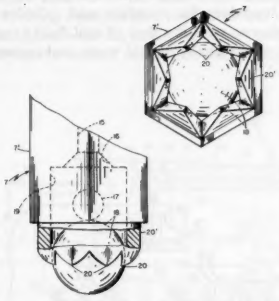
one of said housing parts including a casing receiving said spring, a disk threaded into said casing and forming a seat for said spring, a partition in said one of said parts separating said casing from said chamber and formed with a throughgoing bore slidably receiving an end of said valve member remote from said head, at least one vent passage formed in said partition and communication between the interior of said casing and a space around said valve member, and an axially extensible and contractable bellows anchored at one end to said head and at the other end to said partition and enclosing said vent passage.

3,890,998
CONTROL VALVE

Ansel B. Grose, 8 Mt. Vernon St., Stoneham, Mass. 02180

Filed Aug. 23, 1973, Ser. No. 390,872
Int. Cl. F16k *31/26*
U.S. Cl. 137—436 1 Claim





1. In a fuel control valve for use with a carburator having a float chamber;

a main body portion having a central longitudinal passage comprising;

an upper passageway;

a generally conical passageway having a small end and a large end extending from said upper passageway and merging therewith at its small end;

an extension of reduced size on the main body portion having an enlarged passage extending from the conical passageway at its large end;

a small ball valve member in said enlarged passage;

a ball-shaped plunger in the enlarged passage in engagement with and supporting the small ball valve member;

said extension having inwardly turned prongs at its outer end engaging said plunger member and limiting its outer movement and providing passages between the prongs for fuel flow, whereby during passage of fuel a brisk washing and flushing action is accomplished, and splashing and turbulence in the float chamber is minimized, and said engaging is by point contact;

said extension being of hexagonal configuration on both its inner and outer surfaces, thus providing prongs with flat inner and outer surfaces to expedite inward deflection thereof;

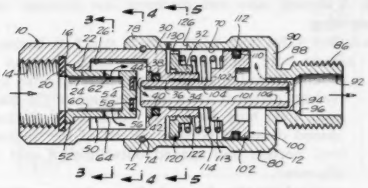
the inner surfaces of said hexagonal extension being closely adjacent said ball shaped plunger providing a guide portion to guide it in a straight path while allowing paths for unimpeded flow of fuel between said guide portions.

3,890,999
FLUID PRESSURE REGULATOR

Eugene D. Moskow, 13243A Figi Way, Marina del Rey, Calif. 90291

Filed Dec. 15, 1972, Ser. No. 315,671
Int. Cl. F16k *31/36*
U.S. Cl. 137—505.25 1 Claim

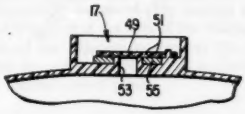
1. A fluid pressure regulator comprising: a body having in-line flow means through the valve body comprising seat means and a valve member that is relatively movable; the valve member being a tubular member, the tubular member having a piston area whereby it is relatively positionable responsive to fluid outlet pressure to control flow and pressure at the discharge, said tubular member having annular ends exposed to pressure havng equal cross sectional areas, the body comprising a first section and a second section, means forming a joint whereby the sections are joined together in relatively rotatable relationship to allow free relative angular movement without relative axial movement, one section having a threaded inlet and one section having a threaded outlet which are in line whereby the regulator is adapted for relative rotation of the sections to facilitate making inlet and outlet couplings, the first section has a sealed aligned bore and the tubular member has a part extending through said bore in the first section and the tubular member piston portion is sealed to a bore in the second section whereby said joint is not exposed to fluid.



3,891,000
IMPREGNATED MAGNETIC FLAP VALVE

Irving Melnick, 324 Forest Cir., Danville, Va. 24541

Filed Nov. 19, 1973, Ser. No. 416,798
Int. Cl. F16k *15/14*
U.S. Cl. 137—525.3 3 Claims



1. A pressure-actuated one-way flap-valve assembly for allowing fluid to flow in a first direction through a valve port but not in a second direction, said flap-valve assembly comprising:

a valve-seat assembly for defining said valve port surrounded by a valve seat, said valve seat assembly including a ferromagnetic cylinder surrounding said valve port; and

a valve-closure member being hingedly attached to said valve-seat assembly adjacent to said valve port so as to be rotatable between a closed position flat against said valve seat and an open position rotated away from said valve seat, said valve closure member comprising a flat, resilient, membrane with freedom to flex and having a plurality of ferromagnetic particles embedded therein;

wherein, one of said valve-seat ferromagnetic cylinder and said valve-closure-member ferromagnetic particles are permanently magnetized to cause a magnetic attraction

therebetween for urging said flat resilient membrane portion toward said valve seat.

3,891,001

SHUTOFF VALVE WITH CLEANOUT FILTER

Irlin H. Botnick, 3155 Kersdale, Pepper Pike, Ohio 44124

Filed Dec. 14, 1973, Ser. No. 424,898

Int. Cl. E03b *7/07;* **F16k** *11/10*

U.S. Cl. 137—549 **18 Claims**

1. A shutoff valve with discharge line drainage capability comprising:

a hollow valve body as an integral structure having

a main bore successively reduced in diameter from a counterbored open end of the body inwardly to form a valving chamber at an inner portion of the main bore, said main bore having an outer female-threaded reduced diameter portion inward of the counterbored end portion and spaced outwardly of said valving chamber,

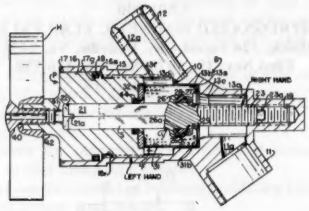
said valving chamber including an inner smaller diameter bore portion and an outer larger diameter bore portion,

said body having an inlet connection with inlet passage opening to the inner portion of the said chamber and having an outlet connection with an outlet passage opening to the larger portion of the chamber;

a valving member axially shiftable, to and from a valve closing location in the inner bore portion and valve opening locations;

a rotatable and axially shiftable valving member operating shaft structure including

a stem axially aligned with said valving member, and



a stem-operating and body-closing rotatable plug having an inner male-thread and engaged in the said outer female threaded portion of the bore,

and a larger diameter outer end portion guidably received in and rotationally and axially slideably sealing with said counterbored open end;

a valve drainage discharge passage in said plug opening exteriorly of said body for valve drainage discharge and opening interiorly of said body through a path opened and closed by axial positioning of a portion of said plug;

said operating structure adapted

upon plug rotation in one direction to position said valving member into valve open position with said plug advanced into the body and sealing to said counterbored open end, and

by plug rotation in the other direction controlling shift of said valving member to a flow blocking position in the valving chamber, with the plug retracted yet in threaded and sealing engagement with the body when the valve closes, and upon further plug retracting rotation axially positioning the plug to open said path for drainage, and with still further rotation to free the plug from the bore for removal with the inlet shut off.

3,891,002

FLUID DELIVERY SYSTEM FOR VOLATILE FLUIDS

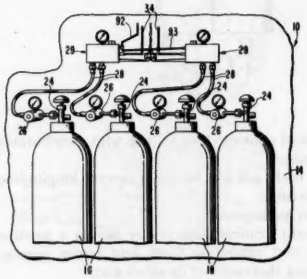
Ronald L. Mowrer; Robert W. Ebbler, both of Menlo Park, and Major F. Gates, Pacifica, all of Calif., assignors to Medental, Inc., Menlo Park, Calif.

Filed Apr. 30, 1974, Ser. No. 465,714

Int. Cl. F16k *37/00*

U.S. Cl. 137—557 **10 Claims**

1. In a system for handling a volatile fluid in a confined space defined by a boundary, the improvement comprising: a cylinder containing a volatile fluid under pressure, said cylinder adapted to be positioned externally of said space; a terminal adapted to be coupled with fluid-actuated equipment usable in said space; manifold means adapted to extend through said boundary for coupling said cylinder and said terminal together to permit a flow of said fluid to said terminal; valve means externally of said space and responsive to a



control signal for controlling the flow of fluid through said manifold means; and means in said space and coupled to said valve means for selectively providing a control signal therefor.

3,891,003

HYDRAULIC MANIFOLD

Ralph M. Duttarer, Buchanan, and Richard R. Hushower, St. Joseph, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

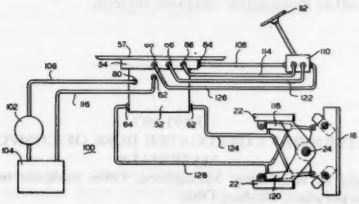
Filed June 18, 1974, Ser. No. 480,327

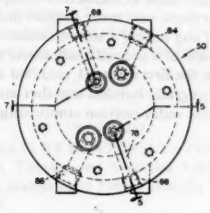
Int. Cl. F16k *25/00*

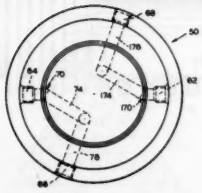
U.S. Cl. 137—561 A **5 Claims**

1. A manifold for reversing hydraulic connections comprising, an outer annular member, an inner circular member

positioned in sealing relation within the said outer member and rotatable relative to the outer member at least a part of a complete revolution, a first pair of connection ports in the said outer member, a second pair of connection ports in the said inner member, a first pair of internal passages in the said inner member connecting the said second pair of ports to a pair of internal ports in register with the said first pair of connection ports, the said first pair of passages arranged so that rotating the said inner member a partial turn relative to the said outer member reverses the hydraulic connections between the said first pair of connection ports and the said second pair of connection ports, a third pair of connection ports axially spaced in the said outer member, a fourth pair of connection ports in the said inner member, and means for maintaining hydraulic connections between the said third pair of connection ports and the said fourth pair of connection ports respectively regardless of the rotative position of the said inner member relative to the said outer member, the said means comprising a pair of grooves in the said inner member in communication with the said third pair of connection ports respectively and a second pair of internal passages in the said inner member interconnecting the said grooves and the said fourth pair of connection ports respectively.





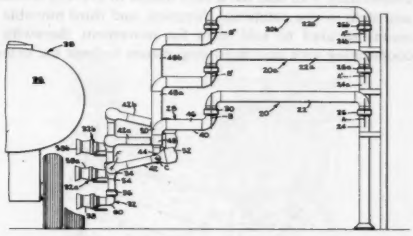


3,891,004

BOTTOM CROSS-OVER LOADING ARM

Houston W. Knight, Whittier, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 24, 1973, Ser. No. 391,415
Int. Cl. F17d *1/00*
U.S. Cl. 137—615 **9 Claims**



1. An articulated fluid loading arm especially for use in transferring fuel from a storage reservoir into a tank truck through a bottom-located cargo inlet, comprising

a. an inboard arm section pivotally mounted on an upstanding riser for movement with respect thereto in a horizontal direction,

b. an outboard arm section pivotally connected to the inboard arm section for movement with respect thereto in a horizontal direction, said outboard arm section including

1. an inner horizontal pipe section extending from the inboard arm section,

2. an intermediate vertical pipe section extending downwardly from the inner horizontal pipe section, and

3. an outer pipe section pivotally connected at its inner end to the lower end of the intermediate pipe section by a first pipe swivel joint oriented on a horizontal axis,

c. a swivelable coupling assembly for pivotally interconnecting the outer pipe section to a bottom-located tank truck cargo inlet, said coupling assembly having an inlet element and an outlet element, and

d. a second pipe swivel joint oriented on a horizontal axis and interconnecting the outer pipe section and the coupling assembly such that the axis of the outer pipe section and the axis of the adjacent portion of the coupling assembly reside in a common plane that is transverse to the axis of said second swivel joint.

3,891,005

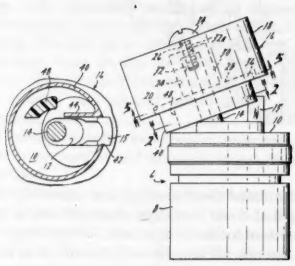
SINGLE HANDLE WATER FAUCET VALVE

Alex Manoogian, Groose Pointe Farms, and Eric V. Pullen, Southfield, both of Mich., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed May 28, 1974, Ser. No. 473,809
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.4 **15 Claims**

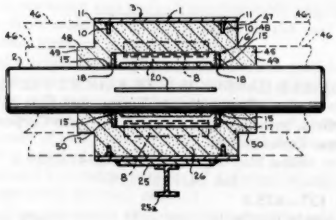
1. A single handle hot and cold water mixing and flow control faucet valve of the type having a main body enclosing relatively movable valve means selectively operable to connect or isolate hot and cold water sources with water outlet means and an elongate manually movable operating stem operably connected to said valve means for movement therewith and projecting from said main body, said stem being swingable in a plane between an off position and a full volume position to vary the flow volume through said faucet valve and rotatable about its own axis between a cold water only posi-

tion and a hot water only position to vary the proportions of hot and cold water passing through said faucet valve, the improvement comprising: fixed stop means secured to and projecting from said main body adjacent said stem, first movable stop means secured to said stem for movement therewith and cooperating with said fixed stop means to prevent swinging movement of said stem to and from said off position unless said stem is in the cold water only position, second movable stop means secured to said stem for movement therewith and cooperating with said fixed stop means to prevent rotation of said stem in one rotational direction, and third movable stop means secured to said stem for movement therewith and cooperating with said fixed stop means to limit the extent of



possible rotational movement of said stem in the other rotational direction.

3,891,006
ANCHOR AND INSULATION ARRANGEMENT FOR CONDUIT
Harvey H. Lee, 1702 Roberts St., Houston, Tex.
Filed July 5, 1973, Ser. No. 376,313
Int. Cl. F16l *3/02, 59/14*
U.S. Cl. 138—106 **9 Claims**



1. An anchor and insulation arrangement for a conduit including:

a. a cage arrangement for securing to the conduit, said cage arrangement including:

1. annular end members secured transversely to the conduit; and

2. members, each including an opening therein, secured between said end members and extending therebetween in circumferentially spaced relation about the conduit;

b. a short outer housing for surrounding the conduit;

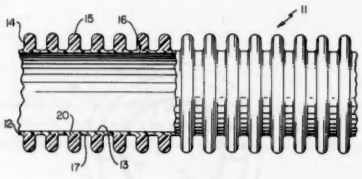
c. said outer housing including longitudinally extending, circumferentially spaced members secured to and extending inwardly of said housing, said longitudinally extending members being radially spaced from said cage arrangement to form a void therebetween;

d. means connected to the outer housing for anchoring the housing to a support;

e. polyurethane surrounding the cage and conduit and filling the void between said cage arrangement and outer housing for insulation of the conduit; and

f. said housing including inwardly extending reinforcing rings spaced from said longitudinally extending members on said housing, said reinforcing rings on said housing and said cage arrangement end members being positioned relative to each other to act in an opposing manner toward each other to inhibit movement of the conduit anchor and insulation arrangement due to end thrust in either longitudinal direction thereon.

3,891,007
EXTERIORLY CORRUGATED HOSE OF COMPOSITE MATERIALS
Donald L. Kleykamp, Springboro, Ohio, assignor to Dayco Corporation, Dayton, Ohio
Division of Ser. No. 268,298, July 3, 1972, abandoned. This application Aug. 23, 1973, Ser. No. 390,816
Int. Cl. F16l *11/12*
U.S. Cl. 138—121 **5 Claims**



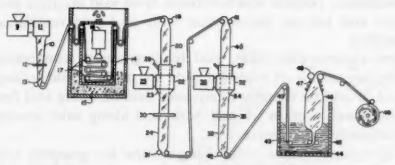
1. A single piece hose construction comprising, inner and outer surface portions, said inner portion made of a first elastomeric material and having a smooth inside surface, and said outer portion made of a second elastomeric material substantially harder than the first material, said first and second materials fused and integrally bonded together and free of defined fused surfaces, said outer portion comprising means of a solid cross section deeper than said inner portion, said means defining an undulating outside surface for said hose construction.

3,891,008

MULTI-LAYER THERMOPLASTIC FILM AND METHOD OF MAKING SAME

Donald J. D'Entremont, Greenville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Dec. 26, 1973, Ser. No. 428,541
Int. Cl.[2] B32B 27/32; B29D 9/08
U.S. Cl. 138—146 11 Claims



1. A multi-layer thermoplastic film comprising:
a. a substrate layer comprising an oriented, cross-linked polymer of ethylene; and,
b. a coating layer comprising a blended mixture having a (1) major portion of an ethylene-propylene copolymer wherein the ethylene constituent of said copolymer is in the range of 0.1 to 10 percent by weight with a (2) minor portion of polybutene-1.

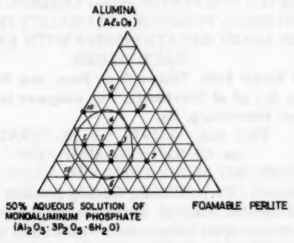
7. The multi-layer film of claim 1 wherein said substrate layer is a seamless tube and said coating layer is on the outside of said tube.

3,891,009

HIGH-TEMPERATURE HEAT-INSULATING STRUCTURE

Fumiyoshi Noda, Toyota, and Yukihisa Takeuchi, Aichi-ken, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Feb. 20, 1974, Ser. No. 443,986
Claims priority, application Japan, Feb. 24, 1973, 48-022503
Int. Cl. C04b 35/18; F16l 59/14
U.S. Cl. 138—149 5 Claims



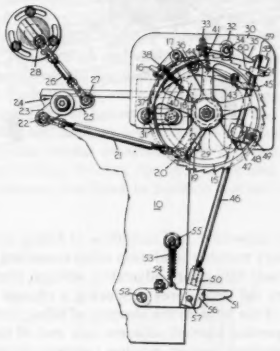
1. A heat-insulating structure comprising a casing filled with a fired ceramic consisting essentially of monoaluminum phosphate, foamed perlite and alumina.

3,891,010

LET-BACK MECHANISM FOR LOOMS

Merton C. Lyman, Jr., Woodstock, Conn., and Ronald Berry, Hopedale, Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1974, Ser. No. 449,512
Int. Cl. D03d 49/00
U.S. Cl. 139—313 6 Claims



1. In combination with a loom having a take-up roll to advance fabric as it is formed with means for rotating the take-up roll including a ratchet, an actuating lever having a feed pawl engageable with the ratchet and a hold-back pawl for maintaining the positions of the roll advanced by the feed pawl, an improved means for selectively controlling let back of the fabric in increments of single picks comprising:
a. disengaging means mounted on the loom for movement between a rest position and first and second positions of operation;
i. said disengaging means including means for disengagement of the hold-back pawl at the first position of operation and for disengagement of the feed pawl at the second position of operation;
b. operating means linked to said disengaging means for moving the latter between its rest and operating positions; and
c. biasing means operatively connected to the hold-back pawl for effecting its re-engagement with the ratchet after disengagement of the feed pawl therefrom.

3,891,011

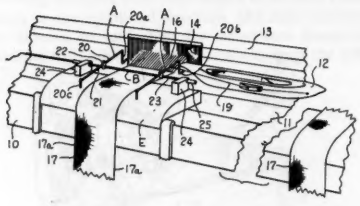
FILLING DETECTING DEVICE FOR NARROW FABRIC LOOM

Robby R. Tisdale, Travelers Rest; Leon C. Rollison, Anderson, and Ben F. Hall, Easley, all of S.C., assignors to Southern Weaving Company, Greenville, S.C.

Filed Jan. 29, 1973, Ser. No. 318,916
Int. Cl. D03d 51/38
U.S. Cl. 139—372 4 Claims

1. A filling detecting device for a narrow fabric loom having a stationary support member and a lay carrying a plurality of shuttles each traversing a respective narrow fabric delivery supplying filling yarn thereto, said yarn extending beyond a

selvage of each delivery as the shuttles traverse comprising: a plurality of pairs of interconnected pivoted elongated drop wires spaced so that one drop wire of each pair is positioned adjacent a selvage of each delivery; means pivoting each pair of drop wires about a horizontal axis parallel to the lay in a medial portion thereof; means mounting said drop wires for



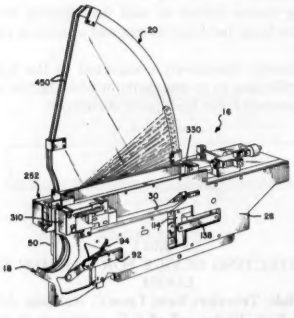
movement responsive to a condition of filling yarn carried by the stationary member; said drop wires extending into engagement with said filling yarn adjacent a selvage; electrical means actuated by the drop wires producing a change in operating condition of the loom in the absence of filling yarn, and a yarn engaging portion carried adjacent one end of the drop wires and an electrical contact portion carried adjacent the other end of the drop wires.

3,891,012

APPARATUS FOR APPLYING TIES TO BUNDLES

Johannes Cornelis Wilhelmus Bakermans, Eiters, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 23, 1973, Ser. No. 408,898
Int. Cl. B21f *9/02*
U.S. Cl. 140—93 A **11 Claims**



1. Apparatus for applying a bundle tie to a bundle of conductors or the like, said bundle tie comprising an elongated relatively narrow strip having a leading end and a trailing end, an opening in said trailing end which is adapted to receive said leading end to permit intermediate portions of said tie to be drawn through said opening so that said tie can be drawn into embracing relationship with said bundle, said apparatus comprising:

frame means having a circular tie application zone,

tie supporting means for supporting said tie in preparation for application to said bundle, said tie supporting means extending tangentially from one side of said tie application zone,

tie feeding means for feeding an individual tie, leading end first, along a predetermined path which extends to, and around, said application zone, said path having a first rectilinear portion which extends along said support means tangentially towards said zone, an arcuate portion which extends partially around said zone, and a second rectilinear portion which extends from said arcutate portion and has an intersection with said first rectilinear portion,

a first reciprocable slide, said feeding means comprising pushing means on said first slide for pushing said trailing end of said tie thereby to advance said tie along said first rectilinear portion of said path and along said arcuate portion to said intersection,

tie tightening means comprising means for grasping said leading end and pulling said leading end away from said zone,

cut off means for cutting said tie adjacent to said opening after said tie has been drawn into snugly embracing relationship with said bundle,

a reciprocable actuator for reciprocating said slide, first rack means on said slide and a gear wheel on said actuator, said gear wheel meshing with said first rack means, said apparatus having second rack means extending parallel to said first rack means, said gear wheel meshing with said second rack means, said second rack means being resistant to linear movement whereby, said gear wheel is rotated during linear movement of said actuator and said first rack means is moved in the direction of movement of said actuator at a velocity which is greater than the velocity of said actuator whereby,

upon actuation of said actuator when a bundle is positioned in said zone, said tie will be fed along said path and its leading end will be fed through said opening at said intersection, and thereafter said leading end will be grasped by said tightening means and pulled away from said zone until said tie snugly embraces said bundle and said tie will thereafter be cut by said cut off means.

3,891,013

APPARATUS FOR POSITIONING LEADING PORTIONS OF INDIVIDUAL WIRES OF A PLURALITY OF WIRES IN SPACED APART RELATIONSHIPS WITH RESPECT TO EACH OTHER

Kenneth Foster Folk; Milton Dean Ross, and Walter Clifton Shatto, Jr., all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 20, 1973, Ser. No. 389,924
Int. Cl. B21f *1/02;* **H01r** *43/00*
U.S. Cl. 140—147 **15 Claims**

1. Apparatus for positioning leading portions of individual detached flexible wires of a plurality of relatively movable wires in spaced apart relationships with respect to each other, said apparatus comprising:

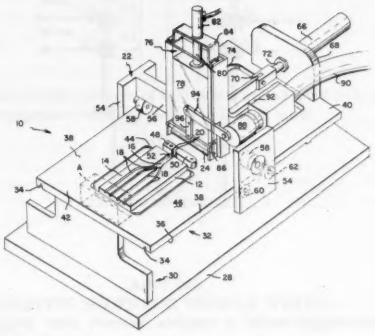
first surface means having a primary groove defined therein capable of substantially accommodating a trailing portion of each of said wires in a bunched together condition and a plurality of secondary grooves defined therein which emanate from said primary groove along separate, spaced

apart paths, each of said secondary grooves being capable of substantially accommodating therein said leading portion of only one of said wires;

holding means for positioning said trailing portions of said wires in said bunched together condition in said primary groove of said first surface means;

second surface means; and

force-applying means for introducing an application of compressive forces on said wires at said trailing portions thereof by bringing said second surface means and said primary groove of said first surface means into close proximity to each other while said trailing portions of said



wires are so positioned in said primary groove of said first surface means by said holding means and for continuing said application of said compressive forces simultaneously along said wires by moving at least one of said first surface means and said second surface means relative to the other such that said application of said compressive forces simultaneously progresses along each of said wires from said trailing portion toward said leading portion of each of said wires whereby said leading portions of said wires are forced individually into respective secondary grooves of said first surface means and thereby positioned in spaced apart relationships with respect to each other.

3,891,014

SCREW MAGAZINE MECHANISM FOR POWER SCREWDRIVER

David T. Gunn, 6203 Dover St. Apt. No. 5, Arvada, Colo. 80004

Filed Mar. 15, 1974, Ser. No. 451,532

Int. Cl. B25b *23/02*

U.S. Cl. 144—32 **26 Claims**

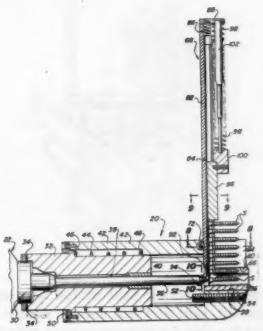
1. A screw magazine mechanism for use with a power driven screwdriver, said screwdriver having a case, a screwdriver bit rotatably mounted in said case and projecting forwardly therefrom for engagement with a screw to be driven, drive means for rotating said bit, and clutch means for drivingly coupling said drive means to said bit upon the application of a predetermined axially rearwardly directed force upon said bit; said screw magazine mechanism feeding screws in succession into operative alignment with said screwdriver bit, and comprising in combination:

an adaptor member fixedly mounted upon said case and projecting forwardly therefrom in coaxial alignment with said bit;

a housing mounted upon said adapter for axial sliding movement relative to said bit and said adapter between a forward end limit of movement wherein said bit is spaced rearwardly from the forward end of said housing by a distance greater than the length of a screw to be driven and a rearward end limit of movement wherein said bit projects from the forward end of said housing;

spring means engaged between said adapter and said housing biasing said housing toward said forward end limit;

screw magazine means detachably mounted upon the forward end of said housing operable when said housing is at said forward end limit to position a screw in a ready



position wherein said screw is in axial alignment with said bit and with the head of said screw facing and spaced axially forwardly from the forward end of said bit; and

cooperating means on said bit and said magazine means operable upon rearward movement of said housing relative to said adapter and said bit for releasing said screw from said magazine as said bit moves into engagement with the head of said screw.

3,891,015

CONSTANT DEPTH CUTTER ASSEMBLY

Kenneth H. Calcagno, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

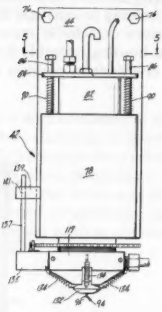
Continuation of Ser. No. 286,378, Sept. 5, 1972, abandoned. This application Aug. 10, 1973, Ser. No. 387,399

Int. Cl. B27c *5/02*; **B27m** *3/00*; **B23c** *3/00*

U.S. Cl. 144—136 J **8 Claims**

1. In an apparatus for use with a cutter for controlling the depth of cuts made in a workpiece, said apparatus being of the

type comprising first means for contacting the surface of the workpiece, said first means including a planar portion the plane of which contains a point positioned so as to lie on an axis of the cutter whereby the cutter will project beyond said point a predetermined distance; and second means upon which said first means is mounted, said second means being operative to enable said first means to be freely universally pivoted about said point, the improvement comprising bearing means disposed vertically above said first and second means for maintaining said point substantially on the surface of the workpiece, said bearing means comprising a motor housing containing a motor for driving the cutter, and an annular



bearing member in which said motor housing is vertically slidably mounted, said first and second means being secured to said motor housing for instantaneous vertically reciprocating movement concurrent with similar movement of said motor housing, an upward component of said vertically reciprocating movement being in response to a vertical force exerted upon said planar portion by vertically rising portions of the surface of the workpiece encountered by said planar portion, and said bearing means further providing instantaneous lowering of said planar portion in response to contact between said planar portion and vertically declining portions of the surface of the workpiece.

3,891,016

APPARATUS FOR CENTERING IRREGULAR PEELER LOGS

Reinhold Hermann Nilberg, 463 Beachview Dr., North Vancouver, Canada

Filed June 14, 1973, Ser. No. 369,837

Int. Cl. B27l *5/04*

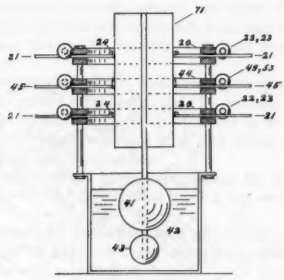
U.S. Cl. 144—209 A **3 Claims**

1. An apparatus for centering peeler logs, on two movable supports, with substantially circular sweep, slight taper and two critical cross sections of irregular shape, comprising in combination:

a sensing unit for sensing the irregular peripheries of two critical cross sections of a log on movable supports for the purpose of duplicating these peripheries,

two duplicating units for duplicating seperately each of said peripheries at a desired ratio,

a cylinder unit in each of said two duplicating units, assigned to shift freely, for the purpose of finding the center



point of the maximum circle in said duplicated periphery, whereby these two center points determine the peeling axis,

a center point sensing unit, as part of a periphery duplicating unit, for sensing the coordinates of said center point, a servo unit, in each of said two movable log supports, for shifting the support in accordance with signals received from the corresponding center point sensing unit.

3,891,017

COMBINATION SCREW AND SCREWDRIVER WITH AXIAL GUIDE SPIGOT

Marian Iskra, 20 Little Sutton Rd., Four Oaks, Sutton Coldfield, Warwickshire, England

Filed Feb. 22, 1974, Ser. No. 444,867

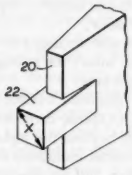
Claims priority, application United Kingdon, Mar. 15, 1973, 12536/73

Int. Cl. B25b *15/02*

U.S. Cl. 145—50 A **5 Claims**

1. The combination of a screw having a head including a transverse parallel-sided slot and a central axial cylindrical bore of greater depth than the slot and of constant diameter throughout its length, which diameter is greater than the width of the slot; and a screwdriver blade comprising a straight edged diametrally extending blade tip for rotational driving engagement with said slot and a central guide spigot porjecting axially substantially beyond the blade tip for operative entry into said axial bore and having a square lateral cross-section substantially greater in width throughout its length than the width of said tip for engagement in said axial bore, the diagonal of said spigot being substantially equal to the diame-

ter of the axial bore, and said spigot being slightly tapered toward its free end and dimensioned to have a press fit in said



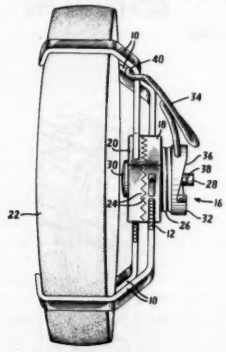
bore, whereby the corners of said spigot are adapted to have biting engagement with the wall of said axial bore.

3,891,018

GRIPPING SHOES FOR VEHICLE WHEELS

Egil Hyggen, Oslo, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Filed Jan. 7, 1974, Ser. No. 431,314
Claims priority, application Norway, Jan. 11, 1973, 121/73
Int. Cl. B60c *27/02*
U.S. Cl. 152—225 **5 Claims**



1. A gripping shoe for vehicle wheels comprising:

a. a central housing having at least two sections normally rotatable with respect to each other, said two sections having surfaces which face each other;

b. at least two gripping members associated with each said housing, said gripping members being J-shaped and having their hooked ends remote from said central housing;

c. means for drawing said gripping members together whereby they can be snugly drawn about a vehicle tire; and

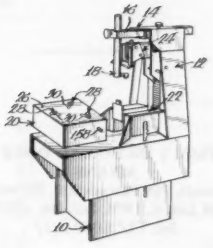
d. means for locking said housing members to prevent them from rotating with respect to each other said means including corresponding protrusions and depressions on said facing surfaces of the two sections of the housing.

3,891,019

TIRE CHANGING APPARATUS

Jimmie L. Holladay, Antioch, Tenn., assignor to The Coats Company, Inc., LaVergne, Tenn.

Filed June 25, 1973, Ser. No. 373,491
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.24 **4 Claims**



1. In a tire changing apparatus including a rim receiving table, means associated with said table for holding a tire rim stationarily thereon, a tire mounting and/or demounting tool and means for effecting relative rotary movement between a rim on said table and said tool, the improvement in said holding means comprising at least three rim engaging elements movably affixed to said table and extending upwardly from a rim receiving surface thereon and movable toward and away from a predetermined position on said table, each of said rim engaging members having downwardly canted surfaces facing said predetermined position; means mounting said rim engaging members for movement on said table toward and away from said predetermined position on said table and providing for a limited amount of movement toward and away from said rim receiving surface in a direction generally non-parallel thereto; and means for moving said rim engaging members toward said predetermined position whereby when said rim engaging members engage the flange of a rim received on said surface, the same will exert a downward force on said rim to cause the same to frictionally lock against said surface to preclude rotation of said rim relative to said table when relative movement is being effected between said tool and said table; said mounting means including slots in said surface, said rim engaging members extending through said slots, and a plurality of links, one for each of said rim engaging members, beneath said slots having one end mounting an associated one of said rim engaging members and the other end pivotally secured to said table; said one end of each of said links being free for limited movement toward and away from said slots in a direction transverse to said surface.

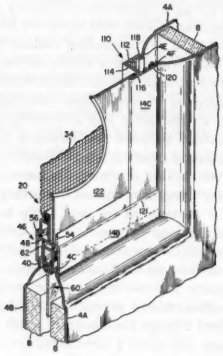
4. A tire changing apparatus including a rim receiving table; said apparatus being adapted to be associated with a tool for use in mounting and demounting tires from rims received on said table; said apparatus further including means for effecting relative rotational movement between the tool associated therewith and said table, said movement effecting means including a fluid actuated, double acting cylinder having an internal dashpot whereby said relative movement may be effected bidirectionally and the rate of movement controlled by said internal dashpot, said internal dashpot having a closed, restricted flow fluid circuit wholly within said cylinder; said double acting cylinder and internal dashpot including a cylindrical sleeve having a pair of end walls and an approximately central wall to provide two compartments; a pair of pistons, one in each of said compartments; a piston rod having an end extending exteriorly of at least one of said end plates and passing through an opening in said central plate and mounting both of said pistons; said opening being slightly larger than said piston rod; and a body of fluid trapped between said pistons to define a dashpot, said opening defining the restriction to the flow of said body fluid in said closed, restricted flow fluid circuit from one side of said central plate to the other side thereof to control the rate of movement of said piston rod.

3,891,020

DOOR ASSEMBLY INCLUDING INSERT STORING MEANS

Anthony R. Mennuto, 769 Pascack Rd., Paramus, N.J. 07652

Filed Jan. 4, 1974, Ser. No. 430,727
Int. Cl.² E06B *3/32*
U.S. Cl. 160—37 **5 Claims**



1. In a door assembly of the type including a pair of panels and a core sandwiched between the panels, the panels having portions which surround a substantially rectangular opening in the upper part of the door, and a frame adjacent the panel portions for defining the opening and for supporting a removable insert therein, the improvement comprising:

the frame including top, bottom and a pair of side members adjacent corresponding panel portions for defining the opening and for supporting the removable insert therein, the top and side members are stationary in the opening and the bottom frame member is removable for exposing a portion of the core in the lower part of the door and which removable frame member separates the upper and lower parts of the door;

the exposed core portion arranged for providing a channel which receives the insert for storage when the insert is removed from the frame;

the stored insert is disposed between the panel portions adjacent the bottom frame member and includes a portion which extends beyond the panel portions;

the bottom frame member includes a downwardly extending first channel portion and an upwardly extending second channel portion;

the first channel portion receives the portion of the stored insert which extends beyond said panel portions adjacent the bottom frame member, and is adjacent said insert and panel portions;

the second channel portion cooperates with the top and side frame members for retaining an interchangeable second insert in the opening when the first mentioned insert is in storage; and

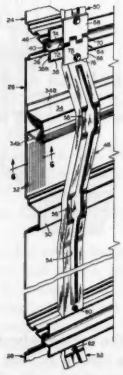
the second channel portion, top and side frame members and second insert cooperate to retain a decorative member in front of said insert when the insert is retained in the opening.

3,891,021

GARAGE DOOR WITH ROLLED OVERLAPPING JOINT FOR ADJACENT PANELS

David Charles Geoffrey, Warren, Mich., assignor to The Stanley Works, New Britain, Conn.

Filed Oct. 1, 1973, Ser. No. 402,580
Int. Cl.² E06B *3/12*
U.S. Cl. 160—235 **9 Claims**



1. A metal door of sectional construction comprising:

a. at least one continous, integrally formed sheet metal

panel section having a body portion with edge portions extending along each of the horizontal edges thereof, one of said edge portions being a roll form including a lip portion of arcuate cross section projecting therefrom in a plane spaced from the plane of said body portion and defining a concave recess in the inner surface thereof, said one edge portion including a rail portion on the inner end of said arcuate lip portion projecting away therefrom;

b. at least one other continuous, integrally formed sheet metal panel section having a body portion with edge portions extending along each of the horizontal edges thereof, one of said edge portions being formed with a cooperating shoulder portion of arcuate configuration spaced from the plane of said body portion thereof and cooperatively configured to slidably seat the outer surface of said arcuate lip portion of said one panel section, said shoulder portion and said lip portion being slidable relative to each other during movement of the door between open and closed positions, said one edge portion including a rail portion on the inner end of said shoulder portion projecting away therefrom; and

c. hinge means including a first leaf hinge portion secured to said rail portion of said one panel section and a second leaf hinge portion secured to said rail portion of said other panel section, said hinge means further including a barrel positioned within said concave recess provided by said lip portion when said panels sections are pivoted relative to each other, said lip portion and said shoulder portion slide relative to each other and said hinge portions pivot relative to each other.

3,891,022

PROCESS FOR MANUFACTURING CORES AND MOULDS

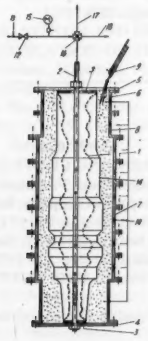
Giorgio Cola, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Continuation of Ser. No. 70,282, Sept. 8, 1970 abandoned. This application May 29, 1973, Ser. No. 364,239

Claims priority, application Italy, Sept. 11, 1969, 21930/69

Int. Cl. B22c *9/28*

U.S. Cl. 164—41 **9 Claims**



1. In the process of forming moulds for castings, comprising the steps of filling a pattern having preshaped and dimensioned walls with fluid wherein the pattern is of an extendible material selected from at least one member of the group consisting essentially of natural and synthetic rubbers which in the unfilled condition lacks shape and rigidity but which upon filling has the shape, dimensioned walls and the rigidity to define the desired profile of the mould, pouring fluidal moulding material about and in contact with the pattern while the pattern is being concurrently filled with fluid to maintain its preshaped and dimensioned walls, and thereafter contracting the pattern by withdrawing the fluid therefrom for removal of the contracted pattern from the set moulding material.

3,891,023

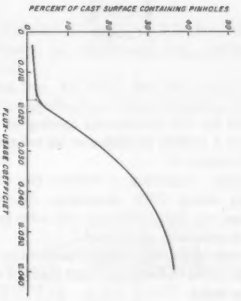
CONTROLLED FLUX ADDITION FOR MINIMIZING SURFACE DEFECTS ON CONTINUOUSLY CAST STEEL

Edward S. Szekeres, Edgewood Boro, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 31, 1972, Ser. No. 302,465

Int. Cl. B22d *27/18*

U.S. Cl. 164—55 **4 Claims**



1. In the method of continuously casting of steel, which includes the addition of a readily fusible flux onto the meniscus of the molten steel, in an amount sufficient to aid in the assimilation of scum, said flux comprising a prefused mixture of, in weight percent,

CaF_2	20 to 60%
CaO	5 to 30%
K_2O/Na_2O	10 to 30%
B_2O_3	5 to 20%
SiO_2	15% max.
Al_2O_3	3% max.
C	10% max.

and exhibiting a melting point within the range of about 1400° to 1900°F,

the improvement which comprises, feeding said flux at a rate below that given by the equation:

$$F_{max} = 0.017(C.S.A.)$$

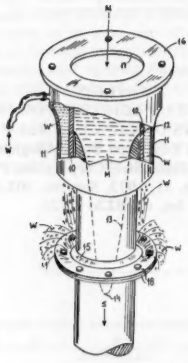
in which, F_{max} is pounds of flux per ton of steel, and C.S.A. is the calculated surface area, in square feet, of a one ton steel billet being cast and being covered by an essentially liquid flux.

3,891,024

METHOD FOR THE CONTINUOUS CASTING OF METAL INGOTS OR STRIPS

Edouard Gervais, Montreal; Henri Levert, Lachine, and Pierre Chollet, Pierrefonds, all of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed June 13, 1973, Ser. No. 369,534
Int. Cl. B22d 11/12
U.S. Cl. 164—89 12 Claims



1. A method for the continuous casting of zinc-aluminum billets of about 5 inches in dia.. .er at relatively high speed comprising the steps of:

a. continuously supplying a molten zinc-aluminum alloy containing about 25% aluminum, 5% copper, 0.05% magnesium, the balance being zinc with incidental impurities, to a relatively short mold;

b. continuously applying a liquid coolant to the outer surface of the mold to form an outer shell of solidified metal within the mold;

c. withdrawing the solidified metal in the form of a billet from the bottom of the mold at a casting speed of about 12 in/min;

d. continuously applying a liquid coolant to the surface of the billet emerging from the mold to cool the billet; and

e. effectively removing all of the liquid coolant from the surface of the billet at a distance from the bottom of the mold which varies between 3¾ and 5¼ inches.

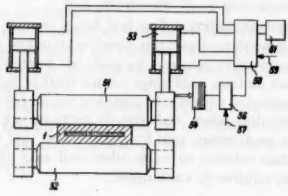
3,891,025

APPARATUS FOR WITHDRAWING A CASTING AND FEEDING A DUMMY BAR IN A CONTINUOUS CASTING MACHINE FOR STEEL

Georg Bollig, Buderich; Horst Grothe, Kaarst, both of Germany; Bernhard Knell, Thawil, Switzerland; Armin Thalmann, Uster, Switzerland, and Josef Zeller, Wessen, Switzerland, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany and Concast AG, Zurich, Switzerland

Division of Ser. No. 267,531, June 29, 1972, Pat. No. 3,812,900. This application Feb. 28, 1974, Ser. No. 446,902
Int. Cl. B22d 11/12
U.S. Cl. 164—154 10 Claims

1. An apparatus for operating a multiple-roll machine, especially a multiple-roll withdrawing machine or a multiple-roll combination withdrawing and straightening machine in a continuous steel casting plant, comprising cooperating pairs of rolls, at least one of said rolls constituting a driven roll, means for adjusting the gap between the cooperating pairs of rolls, stop means for limiting adjustment of the gap between the cooperating pairs of rolls to the prescribed thickness of the casting, means for moving at least one roll of the pairs of rolls towards the casting beyond the stop means defining the prescribed thickness of the casting, said moving means generating a thrust which is smaller than that generated by the adjusting means and said thrust substantially corresponding to the requisite contact pressure for generating the necessary withdrawal force for the casting, and wherein said moving means comprise thrustor means.



8. An apparatus for operating a multiple-roll machine, in particular a multiple-roll withdrawing machine or a multiple-roll combination withdrawing and straightening machine, in a continuous steel casting plant, comprising opposing rolls defining therebetween a gap for the throughpassage of the casting, means for adjusting the gap between said opposing rolls, position reporting means for monitoring the actual thickness of the casting, comparator means for receiving signals from said position reporting means and for comparing such signals with a reference signal, and a servo-control unit for controlling operation of said adjusting means as a function of the operation of said comparator.

3,891,026

APPARATUS FOR BENDING CONTINUOUS CAST SLABS

Kurt Reinfeld, and Emmanuel V. Gouye, both of Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 104,817, Jan. 7, 1971, Pat. No. 3,730,256, which is a division of Ser. No. 837,851, Jan. 30, 1969, Pat. No. 3,590,908. This application Dec. 29, 1972, Ser. No. 319,269
Int. Cl. B22d 11/12
U.S. Cl. 164—282 2 Claims

1. In a continuous casting apparatus, the combination comprising:

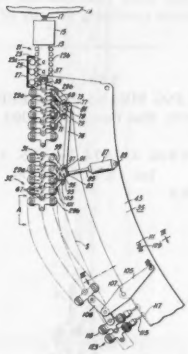
a. a roll bracket that supports a pair of rollers includes:

i. a first bearing fixedly mounted thereto,

ii. a second bearing adjustably mounted thereto, and

iii. a screw jack mounted to said bracket and connected to said second bearing whereby said second bearing is movable relative to said first fixed bearing;

b. means on said bracket for connecting said bracket to an adjacent similar bracket;
c. a roller journaled in said fixed bearing;
d. a roller journaled in said movable bearing;
e. an elongate equalizing arm;
f. a first proportioning bracket pivotally mounted to said equalizing arm;
g. a first arm pivotally mounted to said proportioning bracket;
h. means pivotally connecting said first arm to said roll bracket;
i. a second arm pivotally mounted to said proportioning bracket;



j. means pivotally connecting said second arm to said adjacent roll brackets;
k. a second proportioning bracket pivotally mounted to said equalizing arm and arranged in spaced apart relation to said first proportioning bracket, said second bracket including:
i. first and second housings pivotally connected together,
ii. a third arm pivotally mounted to said first housing, and
iii. a fourth and pivotally mounted to said second housing;
l. means pivotally connecting said third and fourth arms each to one of several brackets.

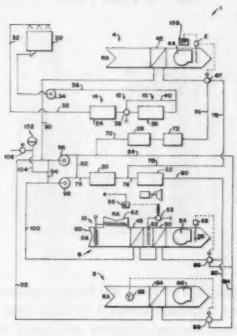
3,891,027

AIR CONDITIONING SYSTEM AND METHOD UTILIZING HUMIDIFICATION OF THE AIR

Edward Russell McFarlan, Westfield, N.J., assignor to Alden I. McFarlan, Westfield, N.J.

Continuation of Ser. No. 177,415, Sept. 2, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,471
Int. Cl. F24f *3/14*
U.S. Cl. 165—2 **5 Claims**

5. In the art of maintaining acceptable ambient conditions within an air conditioned space having a plurality of zones in which one zone may require cooling while other zones may require heating or cooling, and wherein heat is transferred from a zone requiring cooling to a zone requiring heating and wherein heat is discharged from the system only when there is an excess of heat for the entire system and auxiliary heat is added to the system only when there is a deficiency of heat for the entire system, that improvement which comprises as an alternative to discharging excess heat from the system the step of utilizing that excess heat to vaporize water into air passing to a zone or zones to thereby provide cooling for the zone or zones and increase the relative amount of heat in the air while maintaining acceptable temperature conditions, and the step of reducing the relative humidity of the air in the system when changes in the operating conditions create a net heating load for the system thereby to maintain comfort conditions throughout the system while making it unnecessary to add the



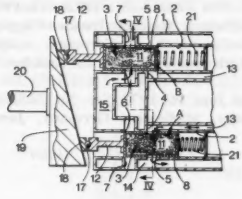
amount of auxiliary heat equal to said excess heat utilized to evaporated the water as an alternative to discharging that excess heat.

3,891,028

REGENERATIVE HEAT EXCHANGER

Robert Noel Penny, 12 Alderbrook Rd., Solihull, Warwickshire, England

Filed Nov. 12, 1973, Ser. No. 414,723
Claims priority, application United Kingdom, Nov. 28, 1972, 54896/72
Int. Cl. F28d *17/00*
U.S. Cl. 165—6 **6 Claims**



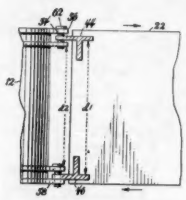
1. A regenerative heat exchanger comprising a housing, a plurality of cylinders contained in the housing and arranged with their longitudinal axes parallel with each other and circumferentially spaced apart around an imaginary pitch circle in the housing, a piston-like matrix contained in each cylinder and reciprocatable therein, each cylinder having a first pair of inlet and outlet ports with which the matrix therein co-operates when it occupies a first position in the cylinder, and a second pair of inlet and outlet ports with which the matrix therein co-operates when it occupies a second position in the cylinder, whereby relatively hot and cold fluid streams passed through the respective pairs of ports will pass alternately through each matrix as each matrix alternately occupies its first and second positions, reciprocating means for reciprocating the matrix in each cylinder such that sequentially one matrix is open to the relatively hot fluid and one matrix is open to the relatively cold fluid, and means for effecting relative rotation between said reciprocating means and said housing, whereby the matrices are reciprocated in their respective cylinders in cyclic order during said relative rotation.

3,891,029

ROTOR ASSEMBLY FOR VERTICAL SHAFT AIR PREHEATER

Robert E. Mahoney, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,506
Int. Cl. F28d *19/00*
U.S. Cl. 165—8 10 Claims



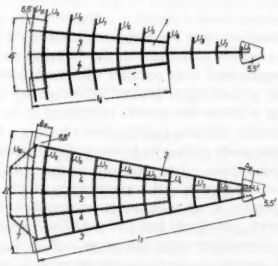
1. Rotary regenerative heat exchange apparatus having a central rotor post disposed about a vertical axis, a plurality of independent sector-shaped baskets arranged in side-by-side relation to comprise an annular rotor around the rotor post, a mass of heat absorbent material contained in the several baskets of the rotor, housing means surrounding the rotor having inlet and outlet openings that direct a heating fluid and a fluid to be heated through the heat absorbent material of the rotor, means for rotating the rotor about its vertical axis, pivot means for attaching the element baskets to the rotor post comprising a tension fitting connecting the upper extremity of each rotor basket and the rotor post and a compression fitting intermediate the lower extremity of each basket and the rotor post whereby each basket is held in position adjacent the rotor post by a combination of forces transmitted by the tension member and the compression member.

3,891,030

CYLINDRICAL HEATING-SURFACE SUPPORT STRUCTURE FOR REGENERATIVE AIR PREHEATERS

Siegfried Hans-Dietmar Schluter, Wenden-Biggetal, and Erich Kraft, Huttseifen, both of Germany, assignors to Apparatebau Rothemuhle Brandt & Kritzler, Rothemuhle, Germany

Filed June 16, 1972, Ser. No. 263,553
Claims priority, application Germany, June 18, 1971, 2130196
Int. Cl. F28d *17/00*, *19/04*
U.S. Cl. 165—10 5 Claims



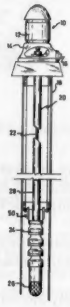
1. Regenerative heat exchange support structure for supporting a plurality of heat exchange element packs in a generally cylindrical cellular arrangement comprising, in combination, a pair of core plates extending in respective planes perpendicular to the axis of the cylindrical structure, a pair of annular ring flanges extending in the same respective planes, the core plates being at a radially inner peripheral region of the structure and the ring flanges at a radially outer peripheral region of the structure, a plurality of pairs of prefabricated sector units, each of said units comprising a full length radial supporting wall extending from radially within an outer periphery of the core plates to radially beyond an inner periphery of the ring flanges and a plurality of chordal connecting sheets carried on the wall, one unit of each of said pairs comprising only one full length radial wall, the plurality of chordal connecting sheets attached thereto defining laterally open-ended volumes and the other unit of each of said pairs comprising an additional full length radial wall extending along each sector edge defining a dividing wall between the units of said pair of units and closing the said lateral open ends of said volumes, the said full length walls being welded between the core plates at their inner ends and the ring flanges at their outer ends, by welds extending radially of the axis.

3,891,031

SEALING MEANS FOR DEEP-WELL

Carlos Mayer Ortiz, Blas Pascal 135-1002, Mexico City, Mexico

Filed Feb. 4, 1974, Ser. No. 439,040
Int. Cl. E21b *43/00*
U.S. Cl. 166—68.5 7 Claims



1. In a sealing means for a wall of a deep-well, a well head, a pump device having an upper end, the sealing means being suitable to connect the wall in a tight manner to the upper end of the pump device, a supporting string supporting the pump device;

a seal carrier means solidarily coupled to the upper end of said pump device and in fluid-flow relationship with the interior thereof;

an outer sealing device arranged to cover said carrier means;

a plurality of O-ring seals carried by said carrier means;

said O-rings being disposed to make a tight joint between said carrier means and said outer sealing device;

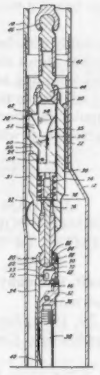
an elastic sealing device coupled to said outer sealing device, being disposed to extend from the latter toward the wall of the well, and uniting in a tight manner said outer sealing device and said wall; and

elastic sealing means located at the uppermost point of the well; whereby a section of the wall interposed between said elastic sealing means and the wellhead is isolated from the bottom of the well and disposed to be employed as a discharge casing.

3,891,032
APPARATUS FOR INSTALLING AND REMOVING FLOW CONTROL DEVICES

Gilbert H. Tausch, and Ronald E. Pringle, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Mar. 29, 1974, Ser. No. 456,094
Int. Cl. E21b *7/06*
U.S. Cl. 166—117.5 **8 Claims**



1. A flow control device handling apparatus adapted for use in placing a flow control device in a selected offset pocket in a mandrel having an orientating sleeve in a well tubing and for removing said device therefrom comprising,

a body adapted to be moved through the well tubing,

a flow control device handling arm supported from the body,

means for laterally shifting said handling arm into position over a selected pocket when the body is oriented,

orientating means connected to the body for coacting with the orientating sleeve for orientating the handling arm relative to the pocket, and

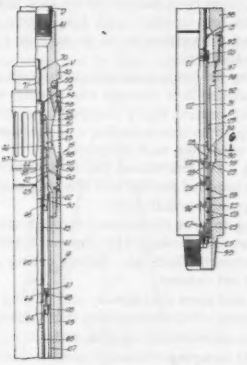
universal joint means in the body between the orientating means and the handling arm for allowing the body to pivot about the universal joint for allowing movement of the body through curved well tubing, but maintaining the orientating means and the handling arm in a predetermined rotational alignment for providing orientation of the handling arm.

3,891,033
ANNULUS PRESSURE CONTROLLED TESTING APPARATUS

Lyle B. Scott, Los Angeles, Calif., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed Jan. 4, 1974, Ser. No. 430,989
Int. Cl. E21b *49/00*
U.S. Cl. 166—133 **28 Claims**

1. Apparatus for performing a drill stem test in a well bore traversing an earth formation in which casing is set comprising: a test string adapted to be connected to a string of pipe and run into the well casing, said test string including a packer having anchor means and packing means expansible into anchoring and sealing engagement with said well casing above said earth formation to anchor said test string in said casing and separate said formation from the casing above said packer, test instrument means associated with said packer and in communication with said earth formation, and shut-in valve means above said packer for controlling the flow of fluid from said formation through said test string, said shut-in valve means including a body connected in said test string, said body having therein a tubular mandrel shiftable longitudinally of said body, valve means including a valve member carried by said mandrel and shiftable therewith to a plurality of successive open and closed positions for enabling and for shutting off the flow of fluid from said formation through said mandrel a

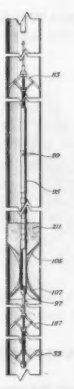


plurality of times as said tubular mandrel is shifted longitudinally in one direction, and escapement control means responsive to the pressure of fluid in said well casing above said packer for controlling the progressive movement of said mandrel and said valve member in said one direction through said plurality of successive positions.

3,891,034
THROUGH-TUBING BRIDGE PLUG HAVING COVERED EXPANSIBLE PACKER

Harrold D. Owen, and Jamie B. Terrell, both of Fort Worth, Tex., assignors to Gearhart-Owen Industries, Inc., Fort Worth, Tex.

Filed Jan. 8, 1974, Ser. No. 431,711
Int. Cl. E21b *33/00, 23/00, 33/12*
U.S. Cl. 166—285 **25 Claims**



1. A method of emplacing a bridge plug in a wellbore penetrating subterranean formation, said wellbore having casing and tubing therein, comprising the steps of:

a. running a packer assembly containing a covered and collapsed packer and locking dogs downwardly through

the tubing to a predetermined depth in said casing in said wellbore;

b. releasing a first set of dogs that engage said casing for holding against an upward force;

c. lifting the cover upwardly from around and expanding said packer and a second set of dogs that engage said casing for holding against a downward force and removing said cover from said wellbore; said packer expanding outwardly into contact with said casing with sufficient force and disposition so as to sustain a cement slurry dumped thereonto;

d. providing an open passageway through said packer to allow fluids to flow through said passageway during curing of any cement slurry dumped onto said packer;

e. removing apparatus including a dog release assembly and a cover tube from said wellbore;

f. dumping a predetermined batch of cement slurry on top of said expanded packer and allowing said cement slurry to set up and partially cure;

g. providing an open passageway through said cement slurry such that said passageway communicates and is maintained open to fluid flow during curing of said cement slurry to set cement;

h. closing said open passageway and pulling from said wellbore a tattle-tail demonstrating that said open passageway has been satisfactorily closed; and

i. thereafter dumping additional cement slurry on top of said cement and said closed passageway and allowing it to set forming a complete bridge plug without requiring removal of said tubing.

19. A through-tubing bridge plug comprising:

a. a vent tube;

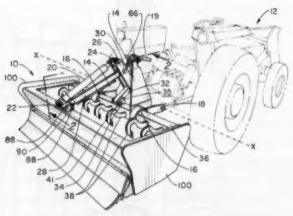
b. a collapsible and extensible packer basket carried by said vent tube, said basket being made up of a plurality of leaves; and

c. a bag covering said packer basket; said bag being of loosely fitting sleeve-like configuration and extending over both the interiorly facing surfaces of said leaves and the exteriorly facing surfaces of said leaves so that the bag is expanded by said leaves when they expand.

3,891,035
SCARIFIER AND SCRAPER ATTACHMENT FOR A TRACTOR

Laurence B. Miller, Van Nuys, and James D. Crook, Redlands, both of Calif., assignors to Digmor Equipment & Engineering, Van Nuys, Calif.

Filed Mar. 28, 1974, Ser. No. 455,851
Int. Cl. A01b *49/02*
U.S. Cl. 172—197 **10 Claims**



1. A scarifier and scraper attachment for a tractor, and the like, comprising:

a frame including means for coupling the attachment to the tractor;

a stop member mounted on said frame;

bearing means mounted on the frame;

a transverse shaft rotatably mounted in said bearing means;

a series of scarifier teeth mounted on said shaft at spaced locations along the length of the shaft and extending radially outwardly with respect to the axis of rotation of the shaft;

a bracket mounted on said shaft;

linkage means including a toggle link pivotally coupled to said bracket and a lever arm having one end pivotally coupled to said toggle link;

a control element coupled to said linkage means to turn said shaft in said bearing means about its axis of rotation, said teeth being turned between an operational position and a retracted position when said shaft is turned by said control element in said bearing means about its axis of rotation;

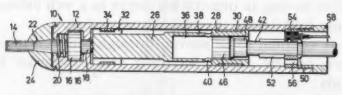
a scraper bucket rotatably attached to said transverse shaft for angular movement about the axis thereof; and

further bracket means coupling said scraper bucket to said linkage means and adjustable to set the scraper bucket at predetermined angular positions about the axis of rotation of said transverse shaft with respect to said teeth.

3,891,036
CONTROL ARRANGEMENT FOR THE FORWARD AND BACKWARD MOVEMENT OF PERCUSSIVE BORING RAMS

Paul Schmidt, Lennestadt, Germany, assignor to Tracto Technik Paul Schmidt, Germany

Filed July 29, 1974, Ser. No. 492,753
Claims priority, application Germany, Aug. 11, 1973, 2340751
Int. Cl. B25d *9/00;* **E21b** *1/00*
U.S. Cl. 173—91 **17 Claims**

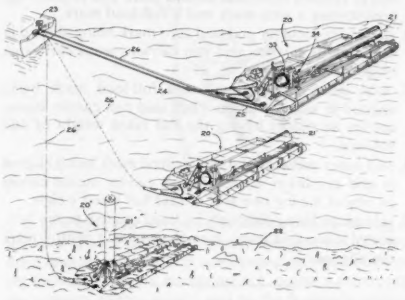


1. In a self-propelled, pneumatically operated, percussive boring ram of the kind comprising a hollow housing, a chisel mounted at the boring end of said hollow housing, a percussion piston reciprocably mounted in said hollow housing, a back stop in said housing for limiting rearward movement of said percussion piston in said housing, said chisel forming a front stop for limiting forward movement of said percussion piston in said housing, means defining a cylindrical chamber in said percussion piston, a tubular valve member having a piston head and located in said housing with said piston head received in said cylindrical chamber, said tubular valve member being adapted to admit compressed air into said cylindrical chamber for reciprocating said percussion piston and thereby driving said boring ram, and means whereby said tubular valve member can be adjusted between two operative axial positions relative to said housing to determine whether said percussion piston acts to drive said boring ram forwards or backwards, the improvement wherein said boring ram includes a guide member attached in said housing and said tubular valve member extends through said guide member, and means for locking said tubular valve member in either of said two operative positions during operation of said boring ram, said locking means comprising axially inter-engaging stops on said tubular valve member and on said guide member, and a releasable catch which, when engaged, prevents rotation of said tubular valve member relative to said guide member, said stops being arranged whereby, on release of said catch, said tubular valve member can be rotated into a position in which said stops are misaligned and allow said tubular valve member to be moved axially from one of said operative positions to the other.

3,891,037
REMOTELY OPERATED SEAFLOOR CORING AND DRILLING METHOD AND SYSTEM

Dale E. Well, 3902 Lincolnshire St., Pascagoula/Miss. Calif. 39567, and Kenneth C. Marley, 1074 Valley Forge Dr., Sunnyvale, Calif. 94087

Filed Dec. 26, 1972, Ser. No. 318,114
Int. Cl.[2] E21B 7/12
U.S. Cl. 175—6 3 Claims



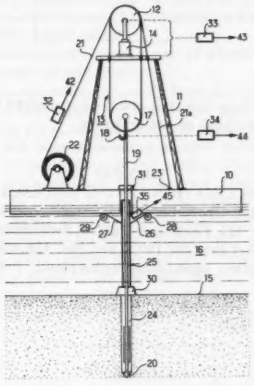
1. An apparatus for emplacing a core barrel, casing, piling or other type of structure having one end thereof adapted for cutting material in the floor of a body of water, including the combination of a support frame, ballast container means on the support frame, means to introduce ballast into said container means to create negative bouyancy for said apparatus, means to remove ballast from said container means to creat-positive buoyancy for said apparatus, means on the frame to support a length of said structure for movement to a position with its longitudinal axis oriented along a predetermined angle of entry with respect to said floor and with said cutting end disposed lowermost, and means to move said one end of the structure to cause the structure to cut into and advance toward said floor along said angle of entry, means to cause said core barrel, casing, piling or other type of structure of oscillate about its longitudinal axis through a pre-determined arc, said means to include a combination of clamping means to releasably engage the outer periphery of said core barrel, casing, piling or other type of structure, means to impart rotary motion to said clamping means when the latter is in clamping engagement with said core barrel, casing, piling, or other type of structure, means to oscillate said clamping means, core barrel, casing, piling or other type of structure through a pre-determined arc about the latters longitudinal axis to include means forming a gear track on said clamping means with said gear track extended about the longitudinal axis of said core barrel, casing, piling or other type structure and means to drivingly engage said gear track with one or more sector gears engaging said gear track and means to oscillate said sector gears through a pre-determined arc and impart rotary motion to said gear track, said clamping means, said core barrel, casing, piling or other type of structure.

3,891,038
DEVICE FOR MEASURING THE POSITION AND SPEED OF A BORING TOOL

André Delestrade, Viroflay, and Roger Marce, Fourqueux, both of France, assignors to Compagnie Francaise des Petroles and Compagnie Generale d'Automatisme, both of Paris, France

Filed June 19, 1974, Ser. No. 480,798
Claims priority, application France, June 28, 1973, 73.23712
Int. Cl. E21b 47/02
U.S. Cl. 175—7 14 Claims

1. In a device for measuring the position of a boring tool supported through a line of rods by supporting means situated on a floating craft, said supporting means including a tackle adapted to hoist and lower said boring tool in response to winding and unwinding of a first cable on a winch fixed on said craft, means for compensating for variations in the vertical position of said floating craft in relation to the bottom of the water, and a tubular member surrounding said line of rods between the opening of a well being bored and said craft, the lower end of said tubular member being adapted to be anchored to the bottom of the water, said tubular member being further held near its upper end by means of at least two second cables which are stretched by their associated winches fixed on said craft, the improvement comprising:



first signalling means associated with said first cable for providing a first signal representative of motion of said first cable along its length;

second signalling means associated with said compensating means for providing a second signal representative of the variation in the vertical position of said craft in relation to the bottom of the water;

third signalling means associated with said second cables for providing a third signal representative of the relative vertical positions of said tubular member and said craft; and

processor means responsive to said first, second and third signals for providing a signal indicative of the position of said boring tool.

3,891,039
METHOD AND DEVICE FOR DRILLING TO A PREDETERMINED SURFACE

Gunnar Lagerstrom, Ektorp, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed May 2, 1974, Ser. No. 466,300
Claims priority, application Sweden, May 15, 1973, 7306858
Int. Cl. E21b 47/04
U.S. Cl. 175—40 13 Claims

2. A device for rock-drilling and/or earth boring of a number of drill-holes to an imagined and preferably plane bottom surface comprising:

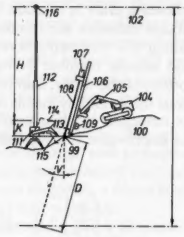
a drilling machine drivable along a feed device to drill holes to the bottom surface,

a registering device connected to the feed device to register the forward feed of the drilling machine along the feed device,

a device for generating a reference surface, defined by electromagnetic radiation, parallel to said bottom surface, and

means associated with the registering device for registering

the sum of the distance in a predetermined direction between said reference surface and the point at which



drilling is to be initiated and the component in said direction of the depth of the drill-hole.

3,891,040

INCLINATION SPRING BALANCE

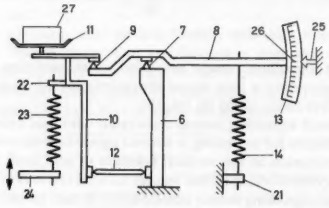
Albert Schmitter, Grueningen, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed Jan. 26, 1973, Ser. No. 326,820

Claims priority, application Switzerland, Feb. 25, 1972, 2714/72

Int. Cl.[2] G01G *1/18*

U.S. Cl. 177—230 9 Claims



1. An inclination balance comprising, in combination:
a. a support, said support being stationary in the normal operating condition of said balance;
b. a balance beam mounted on said support for angular movement about a main bearing axis horizontal in said condition,
   1. said beam having two arms extending from said axis in opposite directions;
c. pan carrier means adapted to carry an object to be weighed;
d. outer bearing means connecting said pan carrier means to one of said arms for pivotal movement about an outer bearing axis spacedly parallel to said main bearing axis, said axes jointly defining a plane;
e. yieldably resilient means opposing angular movement of said beam about said main bearing axis under the weight of said object and including
   1. a helical weighing spring having an axis and two axially spaced terminal portions,
   2. first fastening means fastening one of said terminal portions to said support, and
   3. second fastening means fixedly fastening the other terminal portion to the other arm of said beam,
   4. said second fastening means including means preventing movement of said other terminal portion relative to said beam; and
f. indicating means for indicating the angular position of said beam as a measure of said weight, said indicating means including a scale member and an index member,
   1. one of said members being fixedly mounted on said support, and the other member being fixedly fastened on said other arm,
   2. said scale member carrying a row of numerical weight marks spaced for sequential alignment with said index member during said angular movement of said beam,
   3. said row of marks including a central mark and two groups of marks extending from said central mark in opposite directions and including respective terminal marks farthest from said central mark and respectively constituting a zero mark and a full-load mark,
   4. said index member and said zero mark being aligned in said condition when said pan carrier means carries no object to be weighed,
   5. said index member and said full-load mark being aligned in said condition when said pan carrier means carries an object having the full rated weight of said balance,
   6. said index member and said central mark being aligned in said condition when said pan carrier means carries an object having one half of said full rated weight,
   7. said plane being obliquely inclined relative to the horizontal when said index member and said central mark are aligned.

3,891,041

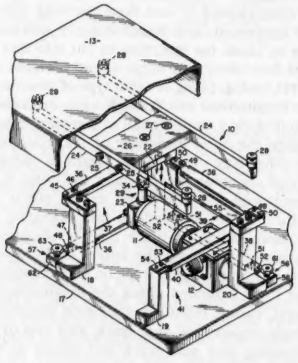
WEIGHING SCALE

Donivan L. Hall, and Walter E. Kupper, both of Toledo, Ohio, assignors to Reliance Electric Company, England

Division of Ser. No. 407,659, Oct. 18, 1973. This application May 15, 1974, Ser. No. 470,149

Int. Cl. G01g *21/24*

U.S. Cl. 177—255 6 Claims

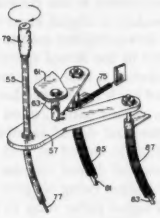


1. A weighing scale comprising, in combination, stationary frame means, movable load receiving means, transducer means for producing weight signals in accordance with movement of the load receiving means, check link means connecting the frame and load receiving means for movement of the load receiving means in a substantially vertical path, the check link means forming with the frame and load receiving means a plurality of parallelograms located in intersecting planes, and means for so adjusting the check link means to cancel errors caused by shifting loads upon the load receiving means parallel to each of said parallelograms that adjustments made to cancel errors caused by shifting loads parallel to any one parallelogram are independent of adjustments made to cancel errors caused by shifting loads parallel to any other parallelogram.

3,891,042
CONTROL ARRANGEMENT FOR A HYDRAULICALLY POWERED VEHICLE

Gerald W. Braun, Rt. 1, Avilla, Ind. 46710

Filed Jan. 21, 1974, Ser. No. 435,279
Int. Cl. B62d 11/04
U.S. Cl. 180—6.48 9 Claims



1. In a hydraulically powered utility vehicle having at least first and second hydraulic motors permanently connected to drive laterally separated ground engaging locomotion producing means, a primary energy source, pump means coupled to the primary energy source and to the hydraulic motors, and control means for controlling the rate and direction of hydraulic flow from the pump means individually through the hydraulic motors, a mechanism for providing single lever operator control for both speed and direction comprising:

a control lever supported on the vehicle and exhibiting at least 2 degrees of mechanical freedom in response to operator actuation;

first and second hydraulic control arms for individual ones of said motors, associated with said control means and movable in a continuous manner between full ahead and full reverse positions;

a control plate pivotably supported on the vehicle for 2 degrees of mechanical freedom;

means coupling the control lever to the control plate;

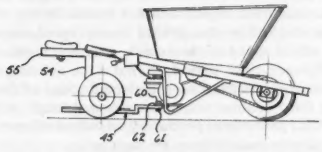
means coupling the first and second arms to distinct points on the control plate, each point being distinct from the point of coupling of the control lever; and

the control lever having 3 degrees of mechanical freedom, the third degree being a twisting movement, and further comprising a cable coupled to the control lever and to the primary energy source for controlling the primary energy source.

3,891,043
SELF-PROPELLED EARTH MOVING DEVICE

George L. Valdex, 3374 E. Pennsylvania Ave., Tucson, Ariz. 85714

Filed May 8, 1974, Ser. No. 467,914
Int. Cl. B62d 53/02
U.S. Cl. 180—13 5 Claims



2. In a single wheel manually directed vehicle for transporting material over smooth or rough terrain, said vehicle including an A-frame shaped framework having an apex and a pair of hand grips extending rearwardly therefrom, a single wheel rotatably secured in proximity to the apex, a pair of legs depending from the framework intermediate the wheel and the hand grips and a bucket mounted upon the framework for carrying material and extending laterally coincident with the wheel and at least partially laterally coincident with the wheel, the improvement comprising in combination:

a. mounting means extending intermediate the legs beneath the framework at or below the center of gravity of said vehicle;

b. a motor attached to said mounting means at the approximate center of gravity of said vehicle, said motor including an output shaft, said motor and said output shaft being shielded in the vertical axis by the bucket;

c. a front wheel sprocket secured to the wheel;

d. a drive train disposed intermediate said output shaft and said front wheel sprocket for driving the wheel in response to energization of said motor, said gear means being fully shielded in the vertical axis by the bucket;

e. means secured to one of the hand grips for regulating the operation of said motor;

f. a platform mounted upon a pair of wheels for supporting an operator of said vehicle;

g. a tongue extending forwardly from said platform;

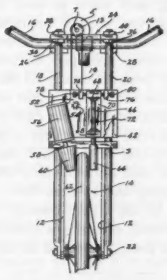
h. nut and bolt means for connecting said tongue to said mounting plate, said nut and bolt means including pivot means for accommodating pivotal movement of said tongue in the horizontal and vertical plane; and

i. means for supporting the operator upon said platform rearwardly of said pair of wheels; whereby, the operator of said vehicle is transported by said vehicle in a manner such that the weight of the operator will tend to exert an upward force acting through said tongue upon said mounting plate to lift the legs of said vehicle off the ground without impeding lateral relative pivotal movement between said vehicle and said platform.

3,891,044
BICYCLE PROPELLING MEANS

Clair L. Tiede, Rt. No. 3, Box 227 E, Muckwonago, Wis. 53149

Filed Nov. 7, 1973, Ser. No. 413,705
Int. Cl. B62k 11/02
U.S. Cl. 180—31 2 Claims

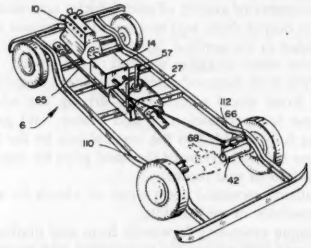


1. In a vehicle having a frame, a wheel supported on an axle on said frame and a tire on said wheel, in combination, a propelling means for said vehicle comprising a power unit on said frame comprising a motor mounted on a support and having a shaft, said support being shiftable relative to said frame in a direction normal to said axle, the axis of said shaft being directed downwardly-convergent toward said wheel and relative to a plane normal to said axle, a cone-shaped roller integral with said shaft and positioned in engagement with said tire, said roller having a degree of taper providing substantially invariable frictional contact pressure with said tire during shifting of said power unit normal to said axle.

3,891,045
HYDRAULIC TRANSMISSION MOTOR VEHICLE

Vincent A. Pancella, 68 First Pl., Brooklyn, N.Y. 11231

Filed Apr. 5, 1974, Ser. No. 458,286
Int. Cl. B60k *17/10*
U.S. Cl. 180—66 R 8 Claims



1. A hydraulic transmission motor vehicle comprising a wheel chassis, a pair of ground engaging wheels for said chassis hydraulic motor means for driving said wheels, hydraulic power means for driving the motor means, control means for controlling said hydraulic power means, combustion power means for operating said hydraulic power means, control means for said combustion power means, and brake means for locking the hydraulic motor means in an immovable position, a frame mounted on said chassis, said control means for controlling said hydraulic power means including a pair of three-position open center directional valves mounted on either side of said frame, said three-position open center directional valves being connected to said hydraulic power means and said hydraulic motor means, a pair of bypass variable orifice valves mounted on said chassis said orifice valves being located in conduits which by-pass said motor means, diverting the pressure fluid back to the hydraulic power means and provided with levers, respectively, and connected intermediate said hydraulic power means and said three position open center directional valves, a control stick displaceable in forward, neutral reverse and left and right directions, means operably connecting said stick to said three-position open center directional valves, means operably connecting said stick to said bypass variable orifice valves, respectively, said connecting means being arranged to open and close said bypass orifice valves proportionally to the steering direction said connecting means comprising a pair of upper cables each having one end secured to an upper end of said stick and one end to one of said levers, respectively, a pair of lower cables secured to the lower end of said stick and one end, respectively, to said levers, said control stick when moved forward or backward restricting the by-pass flow, thereby increasing the power applied to the wheel motors, said control stick, when moved to one side, effecting a restriction of the by-pass flow from the wheel motor disposed on the opposite side.

3,891,046
DIGITAL SPEED CONTROL

Jeffrey A. Oicles, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 1,448, Jan. 8, 1970, abandoned. This application Feb. 3, 1972, Ser. No. 223,318
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 E 7 Claims

1. A digital speed control for maintaining a motor vehicle at a preselected constant speed comprising:

a. means for generating a first digital signal responsive to the actual speed of the vehicle comprising a series of speed signal pulses having a pulse repetition frequency proportional to the speed of the vehicle;

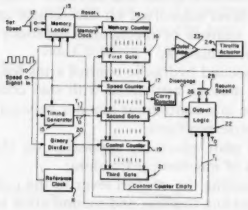
b. means for generating a second digital signal responsive to a constant preselected vehicle speed comprising a digital reference clock, a first digital counter and means for clocking said first digital counter in response to said first digital signal during a first given reference clock period, thereby storing in said first digital counter a first digital number responsive to the preselected speed of the vehicle;

c. means for digitally comparing the first digital signal responsive to the actual speed of the vehicle and the second digital signal responsive to the constant preselected vehicle speed to produce a digital error signal comprising;

d. second digital down counter means clocked by said first signal responsive to the actual speed of the vehicle;

e. means for generating a first and a second timing pulse at the beginning of each reference clock period;

f. first AND gate means gating, upon receipt of a second timing pulse, the first digital number responsive to the speed of the vehicle stored in said first digital counter means to the second digital counter means, said second digital counter means being a down counter clocked by the first digital signal pulse train to count down for one reference clock period, so that if the actual speed of the vehicle is greater than the preselected speed of the vehicle the second counter will count down through zero, and if the actual speed of the vehicle is less than the preselected speed of the vehicle a second digital number will remain stored on the second digital counter;



g. means for generating a "carry" signal when the second digital counter counts down through zero;

h. binary means for dividing the first digital signal responsive to the actual speed of the vehicle;

i. third digital counter means clocked by the divided binary signal responsive to the actual speed of the vehicle;

j. second AND gate means gating, upon receipt of a first timing pulse, the second digital number stored in the second digital down counter to the third digital counter means, said third digital counter means being a down counter clocked by the divided binary signal responsive to the actual speed of the vehicle counting down during one reference clock period, so that if the actual speed of the vehicle is less than the preselected speed of the vehicle the third counter may count down through zero;

k. third AND gate means producing an output whenever the third counter counts down through zero;

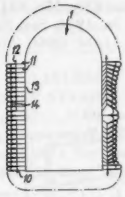
l. means for producing a pulse width modulated error signal having a pulse width proportional to the difference in speed between the preselected constant speed and an actual vehicle speed lower than the preselected speed; and

m. means for adjusting the speed of the vehicle in response to said pulse width modulated error signal to maintain the preselected constant speed.

3,891,047
SKIRTS OF GAS CUSHION VEHICLES

John Edward Rapson, Southampton, England, assignor to Hovercraft Development Limited, London, England

Filed June 5, 1973, Ser. No. 367,121
Claims priority, application United Kingdom, June 6, 1972, 26324/72
Int. Cl. B60v *1/00*
U.S. Cl. 180—117 **10 Claims**

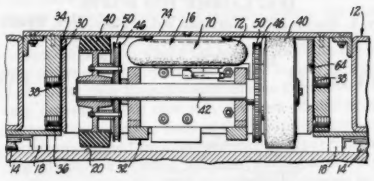


1. A skirt for a gas cushion vehicle comprising upper and lower parts of flexible sheet material, the upper part being connected to the vehicle body so as to be deflectable relative thereto, at least the lower part comprising a contiguous succession of independently deflectable flexible wall members each having an outer portion which faces the gas cushion and a pair of inwardly extending side portions, tie means connecting the side portions to the vehicle body, and adjusting means for causing angular movement of at least inner portions of the tie means in a substantially horizontal plane about substantially vertical axes passing through their attachments to the vehicle, and thereby result in the outer portions of the wall members being moved laterally in a direction towards or away from the vehicle body.

3,891,048
AIR BEARING TRANSPORTER HAVING MULTIDIRECTIONAL DRIVE UNIT

Robert E. Burdick, Goleta, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.

Filed July 30, 1973, Ser. No. 384,090
Int. Cl. B60v *1/00*
U.S. Cl. 180—119 **6 Claims**



1. In a multidirectional drive unit for an air bearing transporter which includes a platform carrying air bearings on its lower side and having a recess in such lower side, the combination of:

a. a drive unit supporting structure in said recess and rotatable therein about a vertical axis;

b. two drive wheels rotatably mounted on said supporting structure and spaced from said vertical axis, said drive wheels being in coaxial relation and spaced apart by 180° about said vertical axis;

c. motor means on said supporting structure for selectively driving said wheels in the same or opposite directions;

d. whereby said wheels either propel the transporter in a given direction, dependent on the orientation of said wheels, or rotate said supporting structure relative to the transporter to reorient said wheels preparatory to propelling the transporter in a different direction at an angle to the first direction mentioned;

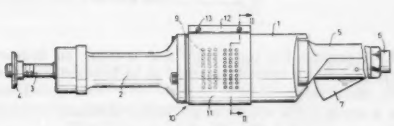
e. with said supporting structure vertically movable in said recess between a lower, extended position in which said drive wheels are engageable with a transporter supporting surface and an upper, retracted position, and the drive unit including actuating means for extending and retracting said supporting structure; and

f. locking means on the transporter and said supporting structure for locking said supporting structure against rotation in any of at least two positions angularly spaced apart by 90°, said locking means including means providing for vertical movement of said supporting structure relative to the transporter.

3,891,049
PNEUMATIC TOOL CONSTRUCTION

Reinhold Stroezel, Leinfelden-Oberaichen; Alfred Hettich, Stetten, and Alfredo Civarella, Leinfelden, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 24, 1973, Ser. No. 391,289
Claims priority, application Germany, Sept. 28, 1972, 72-35753[U]
Int. Cl. F01r *1/08*
U.S. Cl. 181—36 A **5 Claims**



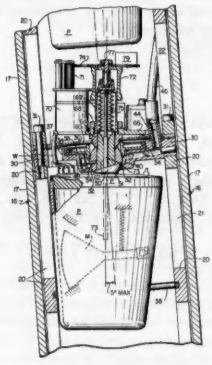
1. In a pneumatic tool, a combination comprising a housing having an axis and including a curved portion having an external surface and provided with outlet openings for spent pneumatic fluid; and a muffler including a curved body dimensioned to embrace said curved portion and comprising a curved strip of sheet metal having an internal surface facing said external surface and defining therewith an annular clearance extending axially of said housing, and at least one shaped member of elastically yieldable foamed synthetic plastic material located in said clearance and interposed between and in contact with said surfaces and defining therewith at least one enclosed tortuous channel for the passage of the spent fluid therethrough, said surfaces bounding said channel in the radially inward and outward directions, and said shaped member having first portions extending in said clearance at circumferentially spaced locations in axial directions of said housing, axially spaced curved section portions connecting respective ends of said first portions, and third portions extending intermediate said first portions away from the respective second portions towards but short of one another so as to define a gap between their adjacent ends, said channel having a first axial section provided with one end portion communicating with said outlet openings, a second axial section having an other end portion spaced in circumferential direction of said clearance from said one end portion, and a circumferentially extending curved third section which extends through said gap and connects said first and second section, said curved strip being provided in the region of said other end portion with a plurality of discharge apertures communicating said enclosed channel with the exterior of said muffler, whereby the spent fluid is restricted to movement in a tortuous path in said channel from said outlet openings through said first, third and second sections to said discharge openings.

3,891,050

BORE HOLE INSTRUMENT PACKAGE SELF-LEVELER

Burnard M. Kirkpatrick, Dallas, and James C. Moore, Rockwall, both of Tex., assignors to Teledyne Industries, Inc., Dallas, Tex.

Filed Mar. 6, 1974, Ser. No. 448,627
Int. Cl. G01d *11/02*
U.S. Cl. 181—102 11 Claims



1. Apparatus for supporting and leveling an instrument package within a housing adapted to be lowered into a borehole, comprising:

a. a controllable source of gas under pressure;

and

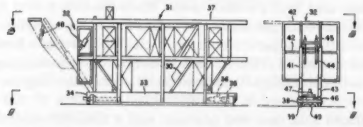
b. gas bearing means including a first bearing member fixed within the housing and a second bearing member attached to said instrument package and supporting the latter pendulously within the housing, and the bearing means including a gas plenum coupled to said source and operatively located with respect to said first and second bearing members to provide, when pressurized, a film of gas therebetween.

3,891,051

SCAFFOLDING UNIT FOR SHIPBUILDING

Senji Takenouchi, Tokyo; Tautomu Yanai, Matsudo; Takamasa Matsumoto, Tokyo, and Hiroyoshi Ohtani, Niiza, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kubushiki, Tokyo, Japan

Division of Ser. No. 219,084, Jan. 19, 1972, abandoned. This application Sept. 28, 1973, Ser. No. 401,955
Int. Cl. E04g *1/18*
U.S. Cl. 182—63 1 Claim



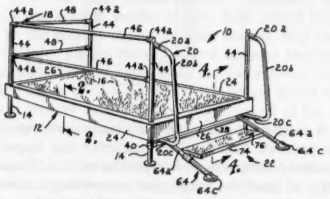
1. A shipbuilding scaffolding unit comprising a movable main body having a plurality of working platforms mounted thereon and also having a pair of opposite sides, a pair of wings each of which is detachably connected to one of said sides, each of said wings having a wheeled carriage to provide a separate mobile unit when a wing is detached from the side to which it is connected, means for raising and lowering said carriage, means for rotating the carriage when raised, each of said wings including a pair of telescopic columns having the lower ends thereof pivoted to the associated carriage, work area means including an upper working platform fixed to the upper ends of said pair of columns, and means for raising and lowering said columns.

3,891,052

ADJUSTABLE PORCH AND STEPS

Herschel D. Lee, Sr., and Herschel D. Lee, Jr., both of 2608 N.W. 66th St., Kansas City, Mo. 64151

Filed Aug. 16, 1974, Ser. No. 497,860
Int. Cl.[2] E04F *11/04*; E06C *9/00*; E04G *1/30*
U.S. Cl. 182—88 10 Claims



1. Elevated platform structure comprising:

a framework adapted to support a platform member;

stanchion means for supporting said framework at different elevations;

first and second spaced apart leg means coupled with said framework at one side of the latter for movement between a retracted position wherein said legs are disposed substantially to one side of an imaginary vertical plane coplanar with said one side to an extended position wherein said legs project from said plane away from said one side, each of said first and second legs being movable in at least two directions independent of the other;

means for holding said first and second leg means at different acute angles relative to said imaginary vertical plane; and

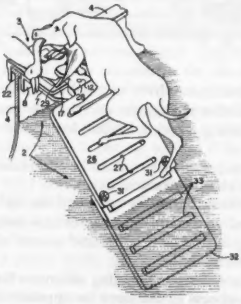
means for presenting a step extending between said first and second leg means.

3,891,053

DOG LADDER FOR BOATS

Henry A. Burton, 855 Harrigan Rd., Fallon, Nev. 89406

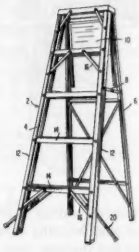
Filed Mar. 6, 1974, Ser. No. 448,558
Int. Cl. E06c *1/08*, *7/48*
U.S. Cl. 182—97 8 Claims



1. A ladder assembly adapted to facilitate egress from a body of water onto a structure on which the ladder is supported, comprising:

a. an adjustable base member detachably mountable on a supporting structure;
b. pivot means mounted on the base member;
c. a ramp assembly pivotally mounted on said pivot pin and adapted to extend at a relatively steep angle downwardly from said base member;
d. said base member including a pair of relatively adjustable base and clamp plates including parallel flanges adjustable to receive a supporting structure; and
e. adjustable means mounted on one of said flanges and adapted to impinge against said supporting structure to clamp the base member thereto.

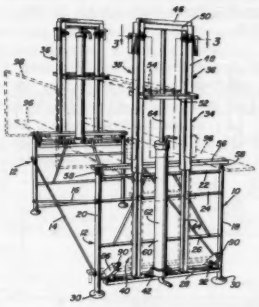
3,891,054
LADDER STABILIZERS
Clayton E. Larson, Brooklyn, N.Y., assignor to White Metal Rolling & Stamping Corporation, Brooklyn, N.Y.
Filed July 9, 1974, Ser. No. 486,811
Int. Cl. E06c *7/42*
U.S. Cl. 182—107 **7 Claims**



1. In combination with a ladder having a pair of side rails bearing step members, a stabilizer comprising:
a pair of channel members each fixed at its top end to the lowest step member of the ladder and at its bottom end to one of the side rails of the ladder between the point of juncture of said lowest step member with said side rail and the foot of said side rail, the channel members being angled downward with respect to said lowest step member,
a bar telescopically carried by each channel member to move between a retracted position where the lower end of the bar is adjacent the corresponding side rail and an extended position where the lower end of the bar engages the plane defined by the feet of the ladder side rails,
a hole extending through each channel member adjacent the corresponding side rail, the axis of the hole being perpendicular to the face of the channel member,
lock means carried by each channel member comprising a pin slidably extending through said channel hole and spring means urging said pin into said channel hole, and a pair of holes extending through each of said bars through which said pin may extend, one of said bar holes being located in the bar so that when the pin extends therethrough the bar is held in said retracted position and the other bar hole being located in the bar so that when the pin extends therethrough, the bar is held in said extended position.

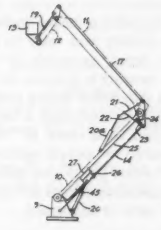
3,891,055
SELF-ELEVATING SCAFFOLD CONSTRUCTION
Alfred A. Medlock, P.O. Box 627, Ocean Springs, Miss. 39564
Filed Dec. 18, 1973, Ser. No. 425,775
Int. Cl. E04g *1/18*
U.S. Cl. 182—141 **12 Claims**

1. A scaffold construction including a pair of end frames each having upper and lower sections guidingly supported from each other for relative vertical shifting, motor means connected between said upper and lower sections for shifting the latter relative to each other, scaffold board support means carried by said upper sections for supporting the opposite ends of boards extending therebetween, said upper and lower sec-



tions including anchor structure for releasable engagement with and support from upper and lower portions of adjacent conventional scaffold end sections, the anchor structure of said lower sections also being provided for releasable engagement with and support from upper portions of adjacent conventional scaffold end sections.

3,891,056
HYDRAULICALLY ELEVATABLE PLATFORMS
Denis Henry Ashworth, Dudley, England, assignor to Simon Engineering Dudley Limited, Cheshire, England
Filed Feb. 7, 1974, Ser. No. 440,552
Claims priority, application United Kingdom, Feb. 21, 1973, 8526-73
Int. Cl. B66f *11/04*
U.S. Cl. 182—148 **11 Claims**



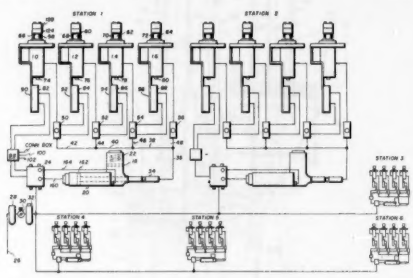
1. Access equipment comprising an articulated boom structure comprising a first boom pivotally mounted at one end on a vehicle or like supporting structure and at least a second boom pivotally connected to the free end of said first boom, hydraulic actuating cylinders connected for effecting pivoting movement of the second boom relative to the first boom and both booms relative to said supporting structure, control valves for said cylinders, movably mounted stops for controlling actuation of said valves, and means associated with each of said booms and movable therewith for transmitting movements thereof individually and collectively to said stops to actuate said control valves, said stops being so arranged that in response to movements of said booms and in accordance with permitted degrees of pivotal movement thereof operation of said actuating cylinders is controlled as appropriate to prevent the boom structure assuming a potentially unstable configuration.

3,891,057

SEMI-AUTOMATIC BEARING LUBRICATOR WORK CENTER

Orlando J. Stevens, Jacksonville, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 11, 1974, Ser. No. 432,713
Int. Cl. F16n 7/40, 13/22, 25/00
U.S. Cl. 184—7 D 5 Claims



1. A bearing lubricator work center comprising

a. a common lubricant storage means and a common lubricant pump for storing a specific lubricant and for pumping said lubricant under pressure,

b. a plurality of lubricant metering means each connected to said common pump to receive said lubricant under pressure and each having lubricant volume adjusting means for passing a specific desired volume of lubricant,

c. a plurality of bearing adapters each sized and shaped to accommodate one of a range of bearing types and sizes,

d. a plurality of lubricant dispensing means each connected to receive lubricant input from an associated of said metering means and each having a connector sized and shaped for receiving selectively each of said bearing adapters,

e. an air filter, air regulator, air line lubricator means and a four-way solenoid operated air valve connected to said pump,

f. said lubricant dispensing means including a slide valve having a spring biasing said valve to normal "off" position, said valve being moveable to a depressed "on" position when a bearing is pressed on its bearing adapter and against said slide valve spring bias, and

g. an electrical system including a micro switch means engageable by said slide valve in "on" position of the latter and connected to operate said solenoid air valve to actuate said lubricant pump and through said metering and lubricant dispensing means to lubricate said bearing when said slide valve is depressed.

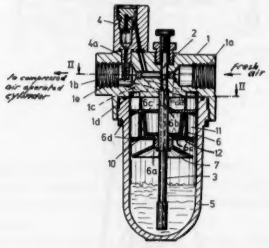
3,891,058

DEVICE FOR OILING AND DE-OILING COMPRESSED AIR

Hans Scharfen, Meerbusch; Karl Heinz Schmitz, Lank-Latum; Theo Strerath, Buttgen-Vorst, and Dragutin Jenko, Roselen-Schlicherum, all of Germany, assignors to Paul Forkardt Kommanditgesellshcaft, Dusseldorf, Germany

Filed June 3, 1974, Ser. No. 475,806
Claims priority, application Germany, June 1, 1973, 2327940
Int. Cl. F16n 7/32
U.S. Cl. 184—55 A 5 Claims

1. A device for oiling and de-oiling compressed air for compressed air operated cylinder-piston systems with reversible piston movement, which includes: housing means having compressed air inlet and means for connection to a supply of fresh air and also having compressed air outlet means for connection to a compressed air operable cylinder-piston system with reversible piston movement, and oil reservoir connected to said housing means for receiving and storing oil, riser means extending from the inside of said reservoir to said housing means, said housing means being provided with passage means communicating with said riser means, control valve means associated with said passage means for selectively varying the free cross section thereof to thereby control the quantity of oil drawn per time unit into said passage means through said riser means, said housing means also comprising a mixing chamber, atomizing nozzle means communicating on one hand with said control valve means and on the other hand with said mixing chamber, that side of said housing means which faces said oil reservoir being provided with annular twist passage means open toward the interior of said oil reservoir, said housing means also being provided with tangential bore means effecting communication between said twist passage means and said mixing chamber, and thereby said outlet



means, insert means arranged within said oil reservoir and connected to that side of said housing means which has said twist passage means provided therein, said insert means comprising an annular wall surrounding said riser means and having its outside surface together with the inner wall of said oil reservoir define annular chamber means communicating with said twist passage means, the inner wall surface of said annular wall defining an inner chamber with perforated bottom and intermediate walls, filter means inserted in said inner chamber so that fluid passing through the perforations of said bottom wall must pass through said filter prior to passing through the perforations of said intermediate wall, conduit means for communication of said inner chamber with said inlet means, and check valve means associated with said conduit means and adapted, by back flowing discharge air of said system to be discharged through said conduit means to partially close said conduit means and said check valve means further adapted to fully open said conduit means in response to entry of fresh air through said inlet means.

3,891,059

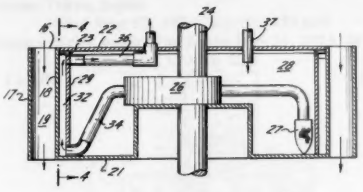
AIR-COOLED OIL SUMP WITH FINS FOR RECEIVING OIL IN A HEAT EXCHANGE RELATIONSHIP

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 14, 1974, Ser. No. 451,055
Int. Cl. F16n 13/00; F01m 5/00
U.S. Cl. 184—104 B 11 Claims

1. A coolable oil sump for use with an internal combustion engine, comprising a generally annular body member having external fins extending radially from the periphery thereof for flow of cooling air thereover, a generally annular insert disposed within the body member, the insert having a hollow interior defining a pump chamber receiving hot oil from the said engine and its exterior periphery defining with the inner periphery of the body member elongated replicate oil passage means in communication with the pump and disposed between the body member and the insert, the replicate oil passage means being in contact with the inner periphery of the cooled body member in heat exchange relationship therewith,

an oil pump disposed within the pump chamber and having means for taking in oil, the pump discharging hot oil into the said replicate oil passage means for cooling, and output pas-



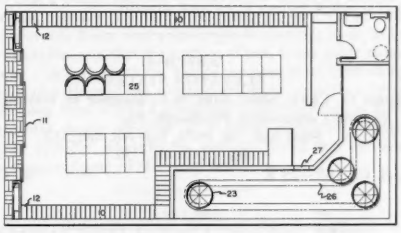
sage means receiving the cooled oil from the replicate oil passage means and delivering the cooled oil to the said engine for recirculation therethrough.

3,891,060

SHOE STORE AND SHOE SELECTION SYSTEM

Warren L. Woods, Salt Lake City, Utah, assignor to Wilwood Inc., Salt Lake City, Utah

Filed Jan. 11, 1974, Ser. No. 432,509
Int. Cl.[2] E04H *3/02*
U.S. Cl. 186—1 R **2 Claims**



1. A novel compact shoe store comprising:
a. a store entrance;
b. a shoe display area located proximate said store entrance;
c. shoe display means in said shoe display area comprising support means to support at least one row of shoe display bags;
d. an enclosed shoe inventory area remotely located from said store entrance;
e. shoe retrieval means in said shoe inventory area comprising an overhead conveyor for supporting shoe bags of substantially the same size and number as said shoe display means.

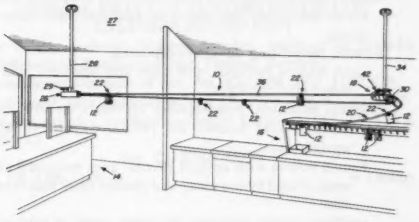
3,891,061

CONVEYOR SYSTEM

Daniel W. Grogan, 832 South Main, Dyersburg, Tenn. 38024

Filed Nov. 19, 1973, Ser. No. 416,841
Int. Cl. B61b *9/00*
U.S. Cl. 186—14 **5 Claims**

1. Apparatus for conveying food orders from a service area to an order filling area, comprising, in combination:
a. first conveying means for providing a first conveyor path from a first area to a second area, and a separate second conveyor path from the second area to the first area, the first conveying means including:
i. a first end pulley arranged in the service area and mounted for rotation about a substantially vertical axis;
ii. a second end pulley arranged at the order filling area and mounted for rotation about a substantially horizontal axis;
iii. an endless belt arranged about the first and second pulleys for movement therewith and forming a pair of runs, each of the runs forming one of the first and second conveyor paths; and
iv. means for rotating one of the first and second pulleys;
b. second conveying means for receiving an order from the first conveyor path at the second area and moving the order to an associated work station, the second conveying means being a downwardly inclined track arranged forming a gravity conveyor, an end of the track arranged adjacent the belt at the juncture thereof with the second end pulley for forming a continuous conveyor path in cooperation with the belt run forming the first conveyor path; and
c. means for guiding the order along the first and second conveyor means, the means for guiding being a clip in-



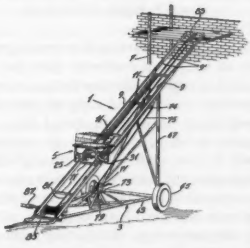
cluding an article gripping portion and a hook portion connected to the article gripping portion and arranged for selectively engaging the belt and track, the article gripping portion and hook portion forming a clip that is balanced when suspended on the belt and track, the article gripping portion including a spring element, jaws connected to the spring element for being biased thereby toward an article gripping position, and a pair of members arranged for selectively applying a counter-bias to overcome the spring element bias and move the jaws to an article releasing position, the hook portion being connected to one of the members, an eye hook being associated with the first pulley and arranged with the run forming the second conveyor path passing thereby for stopping the clip when same is being moved on the second conveyor path.

3,891,062

TELESCOPIC LIFT FOR CONSTRUCTION WORKS

Georges Geneste, Route 52, P.O. Box 597, Bedford, Quebec, Canada

Filed Jan. 7, 1974, Ser. No. 431,306
Int. Cl. B66b *9/20*
U.S. Cl. 187—10 **2 Claims**



1. A brick lift comprising:
a. a rectilinear elongated guide formed of two spaced parallel straight rails defining, in transverse cross-section,

upper and lower flat tracks and flat inner and outer side runways;

b. wherein each rail is formed of a lower hollow part and an upper part of smaller cross-section than that of said lower part and slidably received therein, said parts thereby defining a shoulder at their junctions;

c. a brick carrier movably mounted on said guide and having a rolling undercarriage displaceable on said guide and having a brick carrying platform pivoted at one end to said undercarriage, and means to adjust said platform to hold it horizontal, said undercarriage further comprising:

first rollers mounted for rotation about axes extending transversely of the longitudinal axis of said guide and riding on said flat upper tracks;

second rollers mounted for rotation about an axis extending transversely of the longitudinal axis of said guide and riding on said lower tracks;

third rollers mounted for rotation about axes perpendicular to said guide and riding on said flat outer side runways;

a rattle preventing device comprising:

rigid frames between said rails and adjacent said flat inner side runways;

levers mounted, intermediate the ends thereof, at the ends of said frames for pivotal movement about upright axes;

fourth rollers with upright pivotal axes mounted at the ends of said levers away and distant from said frames, and

resilient means between the other ends of said levers and said frames to bias said last-mentioned rollers resiliently constantly against said inner side runways, and

d. a support for adjustably holding the said guide in upwardly inclined position, said support comprising a base wheeled at one end and pivotally mounted at the other end to the lower end of said guide; a stay pivotally mounted at one of its ends on the wheeled end of said base, and means interconnecting the other end of said stay and said guide to allow relative sliding motion therebetween.

3,891,063

PORTABLE ELEVATOR APPARATUS

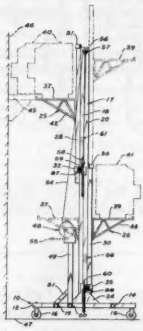
Joseph A. Lucasey, Alameda, and William L. Boscacci, Oakland, both of Calif., assignors to Lucasey Manufacturing Corporation, Oakland, Calif.

Filed Nov. 15, 1972, Ser. No. 306,627

Int. Cl. B66b *9/20, 5/16*

U.S. Cl. 187—11 **7 Claims**

1. Portable elevator apparatus for moving relatively heavy articles such as television receivers and the like from one location to another and for placing the same upon and removing the same from an elevated support therefor at any such location, comprising: a roller-equipped base adapted to be moved manually from one location to another; a standard carried by said base at a generally central position therealong and extending upwardly therefrom; a pair of coequal platform compositions respectively supported by said standard in oppositely facing orientations along opposite sides thereof for reciprocable displacements therealong between lowermost positions generally adjacent said base and elevated positions spaced upwardly therefrom, each of said platforms further including quide structure for reciprocable displacements of said platforms between the lowermost and elevated positions thereof; and mechanism effectively operative between said base and platforms, for selectively displacing either of the latter upwardly from the lowermost position thereof into any



selected elevated positions for placement of such article upon and removal thereof from such support.

3,891,064

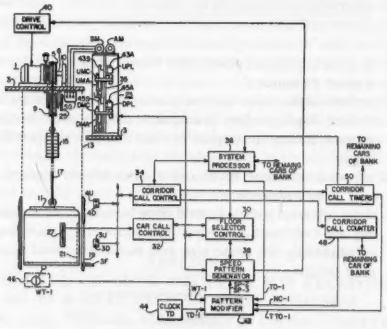
ELEVATOR SYSTEM

James O. Clark, Short Hills, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1974, Ser. No. 461,332

Int. Cl. B66b *1/30*

U.S. Cl. 187—29 R **41 Claims**



1. An elevator system, comprising:

an elevator car mounted for movement in a structure having a plurality of floors,

motive means for moving said elevator car to serve the floors,

means for registering requests for elevator service,

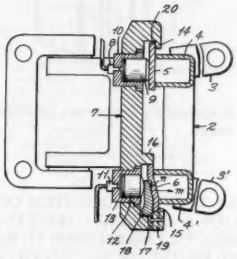
control means providing a speed pattern signal for said motive means, to direct the movement of the elevator car with respect to time in accordance with the speed pattern signal,

and modifying means related to the intensity of demand for elevator service, modifying the speed pattern signal provided by said control means in response to the intensity of demand for elevator service.

3,891,065
MOVABLE FRAME FIXING DEVICE

Katsuhiko Iijima, Tokyo, and Katsuhiko Yoshida, Sagamihara, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1974, Ser. No. 471,059
Claims priority, application Japan, May 31, 1973, 48-62256
Int. Cl. B61h 7/00
U.S. Cl. 188—41 1 Claim

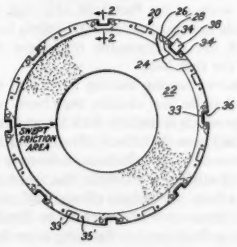


1. A movable frame fixing device for fixing a movable frame, which can move horizontally, to a support frame on a fixed side by fastening with a hydraulic pressure; characterized in that a wedge member is interposed upwardly between a hydraulic cylinder mounted horizontally in the lower portion of the movable frame and a lower guide member so as to be freely rockable, and that the surface of said lower guide member to be contacted with the wedge member is inclined along the inclined surface of the wedge member to generate a vertical fastening force *n* and a horizontal fastening force *m* from a horizontal thrust pressure of a piston produced by said hydraulic cylinder, whereby the movable frame may be fixed to the support frame of the fixed side.

3,891,066
KEYWAY DRIVE FOR MULTIPLE DISC BRAKE

Bruce W. Anderson, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Continuation of Ser. No. 168,273, Aug. 2, 1971, abandoned. This application May 14, 1973, Ser. No. 359,809
Int. Cl. F16d 65/12
U.S. Cl. 188—73.2 7 Claims



1. Key slot apparatus for a multiple disc brake comprising:

a unitary, one piece, annular friction disc provided with a plurality of peripheral spaced-apart axially extending notches having inclined sides defining a generally v-shaped slot;

a plurality of circumferentially spaced-apart axially extending wedge-shaped members each having inclined sides bearing against said inclined sides of said notches in force transmitting relationship wherein the angle of inclination of said sides is selected to effectively minimize the force per unit area imposed on said friction disc and maximize the radially directed force component derived therefrom and imposed on said friction disc; and

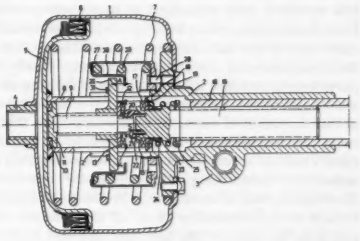
first and second integral annular retaining rings abutting opposite side portions of said annular friction disc;

said wedge-shaped members being interposed between said first and second annular retaining rings, said annular retaining rings being fixedly secured soley to said wedge-shaped member to provide the sole force transmitting medium between said annular friction disc and said first and second annular retaining rings.

3,891,067
CLEARANCE-SENSING SLACK ADJUSTER FOR A VEHICLE BRAKE-ACTUATING PNEUMATIC CYLINDER-PISTON UNIT

Lars Bengt Axelsson, Malmo, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Continuation-in-part of Ser. No. 423,676, Dec. 11, 1973, abandoned. This application June 17, 1974, Ser. No. 480,035
Claims priority, application United Kingdom, Dec. 15, 1972, 57896/72
Int. Cl. F16d 65/56
U.S. Cl. 188—196 D 6 Claims

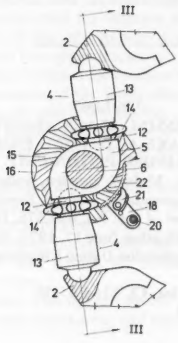


1. A clearance-sensing slack-adjuster having a force delivering stroke direction, preferably built into a vehicle brake-actuating pneumatic cylinder-piston unit, including a force-receiving piston rod and a force-delivering push rod, both rods being substantially tubular and only axially movable in a fixed adjuster housing comprising in combination, an externally screw-threaded adjuster spindle rotationally journalled in the piston rod, a rotationally immovable adjuster nut in said housing about and threadingly engaging said spindle for axial movement therealong, an externally screw-threaded push spindle threadingly engaging the push rod, the diameter of the adjuster spindle being so much less than that of the push spindle that the engagement between the adjuster spindle and the adjuster nut is non-self-locking whereas the engagement between the push spindle and the push rod is self-locking, and means joining the two spindles and transmitting rotational movement from the adjuster spindle to the push spindle at their axial movement in the direction opposite the force delivering direction provided that the axial movement of the adjuster nut has exceeded a set control threshold distance (A) during the preceding force delivering stroke.

3,891,068
AUTOMATIC SLACK ADJUSTER

Sven Erik Camph, Nya Agnesfridsvagen 186, S-213 75 Malmo, Sweden

Filed Apr. 2, 1974, Ser. No. 457,252
Claims priority, application Sweden, Apr. 6, 1973, 7304863
Int. Cl. F16d *65/56*
U.S. Cl. 188—196 BA **5 Claims**



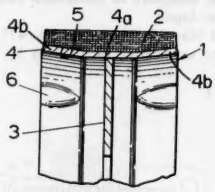
1. An automatic slack adjuster for a brake of the type comprising two brake shoes which during activating of the brake are forced against the inside of a brake drum by means of a key mounted on a rotating key shaft, and in which a brake force transmitting slack take-up element is mounted between each side of the said key and a movable end of each brake shoe, said element comprising two telescopically displaceable parts interconnected by screw threads causing an increase in the length of the element upon relative rotation of said parts in one direction of rotation, characterised in that one of said parts of each said element is connected to a common single clutch part of a one-way clutch comprising two clutch parts capable of performing relative angular movements in one direction in case of excessive movements of said key, characterised in that rotatable parts of the take-up elements are engaging the sides of the said key and that parts of the take-up elements prevented from rotation are engaging the ends of the brake shoes, the said common single clutch part being journalled on the key shaft.

3,891,069
BRAKE SHOES

Raymond Keith Lawrence, Birmingham, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 281,404, Aug. 17, 1972, abandoned, which is a continuation of Ser. No. 82,703, Oct. 21, 1970, abandoned. This application Nov. 26, 1973, Ser. No. 418,874
Claims priority, application United Kingdom, Nov. 21, 1969, 57010/69
Int. Cl. F16d *69/04*
U.S. Cl. 188—250 G **4 Claims**

1. A brake shoe for use in an internal shoe drum brake comprising a rigid carrier generally arcuate in a peripheral direction and including a platform part and at least one web, said platform part being generally concave in transverse cross-section and including a flat central portion to which said web is attached, and outwardly sloping inclined wings, unbroken radial inward depression means in at least one of the wings, said depression means not extending transversely to the center of the platform part, and lining material attached to said platform part solely by direct moulding thereto, the outer surface of said lining material being transversely flat and with the inner portion occupying said concave cross-section and said depression means to key said lining material to said platform part against transverse and arcuate displacement when

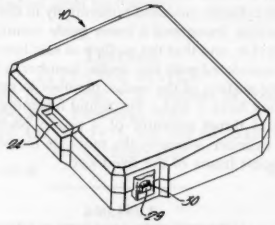


said material is applied by the carrier to a drum during application of the brake.

3,891,070
ASSEMBLY TYPE FILING SYSTEM COMPRISING PORTFOLIOS AND FILING CABINETS THEREFOR

Sergio Montanari, Via Leopoldo Nobili 11, Rome, Italy

Division of Ser. No. 195,276, Nov. 3, 1971. This application June 19, 1973, Ser. No. 371,508
Int. Cl. A45c *3/02*
U.S. Cl. 190—41 R **6 Claims**

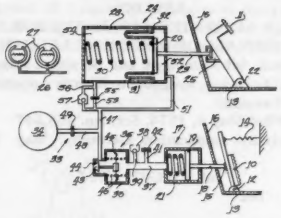


1. A one-piece plastic, briefcase type portfolio comprising:
a first half having a bottom, a front wall, a rear wall and two side walls which, near the union with the front wall, have two recessed parts; and
a second half having a bottom, a front wall, a rear wall and two side walls which, near the union with the front wall, have two recessed parts matching the recessed parts of the side walls of the first half, the edge of said side and front walls being extended and slightly inclined inwardly, on which are superposable the edges of the matching walls of the first half;
said two halves having mating hand and closure portions defining handle and closure members, and being joined by a strip which is unitary with the rear walls thereof but of less thickness than the walls of said halves wherein, at the bottom of each half thereof, there is affixed a part of a sheet of stiffening material the front part of which is detached from the bottom of said half, said detached part having a transverse fold such as to divide said detached part into a first portion forming a predetermined angle with the glued part and a second end portion forming with said first portion a more obtuse angle, said angles being such that when the portfolio is closed, the two end portions are close together so as to press resiliently between them the free edges of sheets which may be contained in the portfolio; said detached part of said sheets having affixed thereto a pad of expanded, spongy material, said pad acting between the detached part and the front part of the bottom of the respective portfolio half so as to increase the resilient holding of the free edges of the sheets between the detached parts of the sheets.

3,891,071
TRANSIENT BRAKE APPLICATION UPON ACCELERATOR RELEASE

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 10, 1973, Ser. No. 423,382
Int. Cl. B60k 29/02
U.S. Cl. 192—3 TR 11 Claims

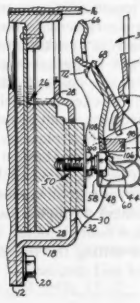


2. A transient brake control system as set forth in claim 1, including a dashpot operatively connected to said engine control means, a conduit extending between said dashpot and the opposite end of the valve housing, and a restricted ambient air inlet communicating with said conduit.

3,891,072
CLUTCH LEVER WITH LOW FRICTION PIVOT

William Howard Sink, Auburn; and Richard Allen Flotow, Ft. Wayne, both of Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Sept. 5, 1973, Ser. No. 394,539
Int. Cl. F16d 13/38
U.S. Cl. 192—99 A 5 Claims

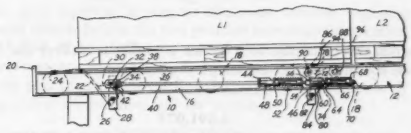


1. An improvement in a clutch having a central axis and including: a drive member; a clutch cover; a driven member; a pressure plate disposed adjacent the driven member and adapted to be moved axially into and out of engagement with the driven member; means for urging the pressure plate into engagement with the driven member; lever means pivotally connected to said cover for moving said pressure plate into and out of engagement with the driven member; the improvement in said clutch comprising: fixed pivot means carried on said cover and having a pivot axis, said pivot means including a sharp knife-edge on said pivot axis and at least one integral lug having a radially inward axially extending surface extending therefrom parallel to the axis of said clutch the plane of said surface including said pivot axis, said lever connected to said pressure plate and including a flat bearing surface engaging said knife-edge on said pivot means, at least one opening in said bearing surface having spaced inner and outer edges, said lug on said pivot means extending into said opening on said lever, and said inwardly directed surface of said lug engaging said inner edge of said opening to thereby define coacting restraint means along said pivot axis constantly engageable for preventing relative sliding movement between said pivot means and lever.

3,891,073
CONVEYOR STOP

Bestor P. Coleman, Willow Springs, and Kennedy McConnell, Riverdale, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed May 7, 1973, Ser. No. 358,118
Int. Cl. B65g 13/00
U.S. Cl. 193—35 A 12 Claims



1. A load spacing mechanism for a load conveyor including an actuating member movable between extended and retracted positions in response to the absence of presence of a load thereon respectively, stop means movable between retracted and extended stop positions, said actuating member and stop means being longitudinally spaced from each other in the direction of movement of the load on the conveyor, elongate linkage means continuously extending between said longitudinally spaced actuating member and stop means, said elongate linkage means being mounted for longitudinal movement toward and away from said spaced actuating member and stop means, and first and second pivotal mounting means for pivotally mounting said actuating member and stop means respectively for movement between said positions, wherein the improvement comprises in combination therewith:

first urging means acting between said elongate linkage means and said stop means urging said stop means to said extended stop position in response to a force exerted on said first urging means by and upon said longitudinal movement of said elongate linkage means in a first direction due to movement of said actuating member to said retracted position, but permitting said stop means to remain in said retracted position in the event that a load is positioned on both said stop means and actuating member, and

second urging means urging said linkage means to longitudinally move in a second direction opposite said first direction to move said actuating member to said extended position and said stop means to said retracted position in the absence of a load on said actuating member, but being overcome by said actuating member when a load is positioned on said actuating member.

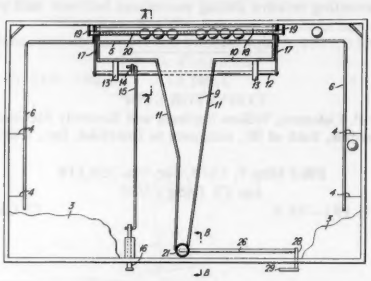
3,891,074
TABLES FOR PLAYING GAMES

Derek Leonard Barnes, 600 Halstead Rd., Enfield, England

Filed Jan. 11, 1974, Ser. No. 432,632
Claims priority, application United Kingdom, Jan. 25, 1973, 3733/73
Int. Cl. G07f 17/32
U.S. Cl. 194—1 R 13 Claims

1. A table for playing a game with a plurality of balls normally used on at a time, comprising a storage space for all the balls after they have been lost from play; a lifting component located in the base of the storage space and mounted between pivoted supporting arms rockable by a mechanism operable from outside the table to raise said component in the storage

space in order to lift all the balls assembled therein and deliver them simultaneously to a higher, intermediate surface, on



which the balls pass to a device actuable to deliver the balls one by one to a yet higher playing surface.

3,891,075

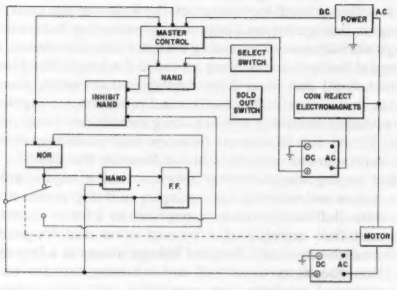
SOLID STATE CONTROL CIRCUIT FOR VENDING DEVICES

William James House, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 12, 1973, Ser. No. 415,039

Int. Cl. G07f *5/18*

U.S. Cl. 194—9 R **8 Claims**



1. A solid state control circuit for vending devices comprising:

a coin changer mechanism including a coin actuated switch,

an AC to DC pulse converter coupled to and controlled by said coin actuated switch,

a bistable latch circuit having first and second stable states coupled to said AC to DC pulse converter and switchable between said first and second stable states in response to pulses from said AC to DC pulse converter,

a first relay coupled between said coin changer mechanism and said bistable latch circuit for selectively enabling and disabling said coin changer mechanism in response to signals from said bistable latch circuit,

a plurality of article vending stages coupled to said bistable latch circuit,

an article selection switch in each article vending stage,

a two input logic gate in each article vending stage having one input coupled to said bistable latch circuit and one input coupled to said article selection switch whereby said two input logic gate generates an enabling output upon receiving inputs from both said bistable latch circuit and said article selection switch,

a vend motor control circuit coupled to said two input logic gate for activation upon receipt of said enabling output therefrom,

a first feedback circuit coupled between each of said article vending stages and said bistable latch circuit for resetting said latch circuit; and,

a second feedback circuit coupled between each of said article vending stages and said coin changer mechanism for rendering said coin changer mechanism inoperative upon detection of a predetermined condition in each of said vending stages.

3,891,076

MANUALLY ACTIVATED APPARATUS FOR TIMING INTERVALS OF DIFFERENT LENGTH

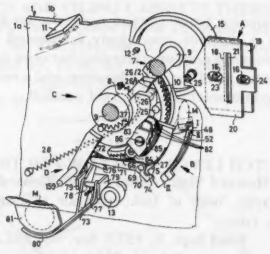
Ortwin Wokóck, Schwenningen, and Bernhard Kaiser, Villingen, both of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed May 9, 1974, Ser. No. 468,447

Claims priority, application Germany, May 10, 1973, 2323567

Int. Cl. G07f *17/24*

U.S. Cl. 194—102 **26 Claims**



1. In a manually activated apparatus for timing with a timer intervals of different length which are selected in dependence upon a characteristic of an inserted coin which is identified by a coin tester, particularly in a parking meter, the improvement wherein said coin tester comprises a combination of a coin receiver adapted to receive coins of different diameters; first and a second normally blocked levers biased for movement in mutually opposite directions about a joint axis of rotation, into detecting engagement with a plurality of angularly spaced points on the circumference of a coin in said receiver, so as to detect the diameter of such coin; manually operable means for unblocking said levers for said movement, and for subsequent joint angular displacement through a distance which is dependent upon the detected coin diameter; and control means on one of said levers for setting the timer to an interval whose length is a function of said distance.

3,891,077

HIGH-SPEED PRINTER

Wolfgang Sauerbrunn, Gerlingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 24, 1973, Ser. No. 409,336

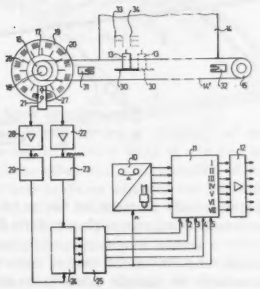
Claims priority, application Germany, Oct. 27, 1972, 2252767

Int. Cl. B41j *3/05*

U.S. Cl. 197—1 R **20 Claims**

1. A high-sped printer for alphanumerical characters, comprising a printing head driven back and forth along a band-shaped character record by means of a reversible drive motor and comprised of *r* printing elements adapted to print as many as *r* dots in a column; a character generator for registering characters in the form of a dot matrix composed of *c* columns and *r* rows and provided with *r* information outputs and *c* column-selection inputs and operative for presenting at said *r* outputs signals representing the dots in the column corresponding to whichever one of said *c* inputs has a selecting

signal applied thereto, said *r* outputs being connected to said *r* printing elements; and reading means for reading out said character generator column-by-column and for causing said *r* printing elements to print the corresponding dot-matrix alpha-numerical character column-by-column, by cyclically applying selecting signals to successive ones of said *c* inputs, said reading means comprising a coded disk mounted on and rotating in synchronism with the output shaft of the drive motor and provided with synchronizing markings arranged in first and second concentric tracks, the first track containing at least one group of *c* equiangularly spaced markings respectively corresponding to said *c* column-selection inputs, and the second track containing at least one reset marking, first and



second detectors respectively detecting the markings in the first and second tracks and generating corresponding first and second synchronizing signals, a binary counter having a clock input and a reset input respectively connected to the outputs of said first and second detectors for receipt of said first and second synchronizing signals, respectively, and a binary-to-decimal decoder havings its inputs connected to the binary counter outputs and having *c* outputs respectively connected to said *c* column-selection inputs for applying selecting signals to the latter, and wherein said reset marking in said second track is angularly offset relative to said group of markings in said first track such that resetting of said binary counter occurs subsequent to the printing by said printing head of a complete character.

3,891,078

RIBBON SHIFTING ARRANGEMENT

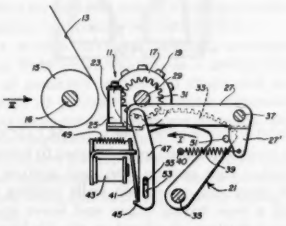
Friedrich Jung, Erlangen, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed Mar. 13, 1974, Ser. No. 450,560

Claims priority, application Germany, Apr. 27, 1973, 7316036

Int. Cl. B41j *35/22*

U.S. Cl. 197—156 **6 Claims**



1. In a printer, the combination comprising:

a print wheel supported for rotation about an axis and having a plurality of characters on the periphery with associated gear means for rotation therewith,

a gear segment cooperating with the gear means of said print wheel and being pivotally movable relative to a rest position for rotating the print wheel to position the different characters for printing,

a ribbon fork pivotally supported for movement from a rest position to a first raised position and a second raised position to bring different portions of the ribbon into printing relation with a selected character on the print wheel,

resilient biasing means urging said ribbon fork to a raised position,

a control pawl connected to said ribbon fork,

an armature of a control magnet normally located in blocking relation to the movement of said control pawl to limit the movement of said ribbon fork to said first raised position and being movable from blocking relation with said control pawl for enabling movement of said ribbon fork to the second raised position, and

said gear segment having an abutment thereon engaging said ribbon fork in the rest position preventing movement of said ribbon fork to a raised position and permitting movement of said ribbon fork to a raised position only as the gear segment moves from its rest position to rotatably position a type character for printing.

3,891,079

BULK MATERIAL UNLOADER

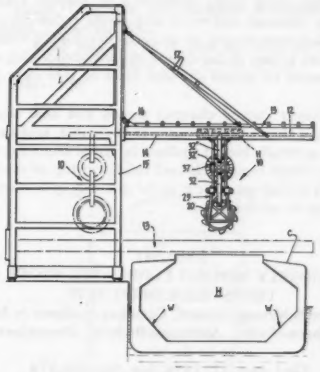
Howard Frank Roper, Upwey, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed July 1, 1974, Ser. No. 484,928

Claims priority, application Australia, July 2, 1973, 3894/73

Int. Cl. B65g *63/00*

U.S. Cl. 198—36 **10 Claims**

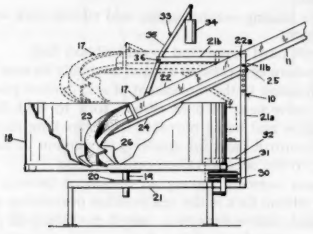


1. A bulk material unloader including means for digging the material from a bulk supply, said digging means being arranged to discharge the collector material into an elevator means for raising the material to an elevated position with respect to the digging means, characterised in that said elevator means comprises a plurality of elevator wheels of rigid open channel cross section divided into a plurality of material retaining pockets, each wheel being rotatably mounted on a supporting frame in ascending relationship with respect to each other and each wheel being arranged to discharge the contents of its pockets by gravity into the pockets of the next most elevated wheel with the lowermost wheel receiving material from said collecting means, driving means for rotating said wheels at a substantially common speed, and means for collecting the material discharged from the uppermost elevator wheel.

3,891,080
BOTTLE RECEIVING APPARATUS

Reuben J. Neises, Wisconsin Dells, Wis., assignor to Leroy F. Stertz, Marshfield, Wis., a part interest

Filed Oct. 29, 1973, Ser. No. 410,957
Int. Cl.[2] B65G *47/00*
U.S. Cl. 198—43 **4 Claims**



1. A bottle receiving apparatus comprising:

a. guideway means for receiving bottles at an upper location and permitting said bottles to slide downwardly by gravity to a lower location;

b. said guideway means having an upper receiving end, a lower discharge end and a lower curved channel means for increasing the frictional forces on downwardly sliding bottles to cause substantial deceleration of said bottles before discharge thereof from said discharge end;

c. a bottle receptable beneath the discharge end of said guideway means, said receptacle having a bottle receiving surface which is movable beneath said discharge end in the direction of bottle discharge;

d. a sled plate pivotally mounted to said guideway means, said sled plate being positioned to support said lower curved channel means on said bottle receiving surface, said sled plate having an upward curvature in a direction opposite to that of the underlying bottle receiving surface movement to permit the sled plate to ride over bottles; and

e. said lower curved channel means and said sled plate mounted thereto being upwardly movable, said sled plate being normally biased against the bottle receiving surface of the bottle receptacle and riding on top of discharged bottles in said receptacle as the quantity of bottles in said receptacle increases.

3,891,081
REVERSIBLY MOVING ELONGATED STOCK IN TRANSVERSE DIRECTION

Klaus-Peter Schirmag, Lintorf, Germany, assignor to Mannesmannrohren-Werke Aktiengesellschaft, Dusseldorf, Germany

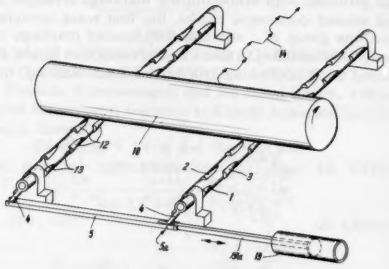
Filed Aug. 12, 1974, Ser. No. 496,574
Claims priority, application Germany, Aug. 28, 1973, 2343769
Int. Cl.[2] B65G *25/04*
U.S. Cl. 198—218 **6 Claims**

1. Device for moving elongated work-pieces, such as rolled stock (tubes, pipes or the like) in direction transverse to the direction of elongated extension, comprising:

a plurality of elongated rolls, arranged parallel to each other and extending in the direction of desired transverse direction;

a first pair and a second pair of rows of cams on each of the rolls, the cams of one of the rows of the first pair arranged staggeredly with regard to the cams of the other one of the rows of the one pair, each cam of the one and of the other row having a rather steep axially facing stop surface and a less inclined running surface in the opposite axial direction, the rows of cams of the second pairs having also staggeredly arranged cams with steep and less steep surfaces facing respectively in the opposite direction as the cams of the first pair;

and means for synchronously turning the rolls back and forth, whereby a first range covered has the rows of cams of the first pair alternatingly in upright position to move

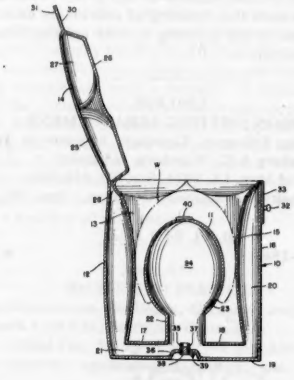


a work-piece axially in steps in the axial direction in which the less inclined cam surfaces of the first pair face, and whereby a second range covered by back and forth movement of the rolls has the rows of cams of the second pair alternatingly in upright position to move a work-piece axially in steps in the opposite direction.

3,891,082
INFLATABLE WIG TOTE

Janet E. Fail, R.R. No. 2 Box 84, Plainfield, Ind. 46168

Filed Oct. 11, 1973, Ser. No. 405,317
Int. Cl. A45c *3/00, 13/00;* **B65d** *85/18*
U.S. Cl. 206—8 **5 Claims**

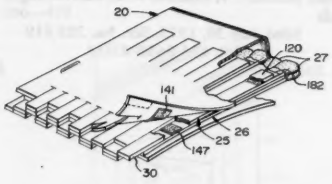


1. An inflatable wig support and carrying case comprising an inflatable bladder adapted to be inserted to form a support for a wig and a case portion, the case portion including spaced-apart inner and outer side walls forming a side air chamber and a base having upper and lower spaced-apart walls forming a bottom air chamber, the bladder being secured to the upper wall of the base and the interior of the bladder communicating with the bottom air chamber so that inflation of the bladder inflates the bottom air chamber, and valve means for inflating the bladder and the side air chamber.

3,891,083
MATCHBOOK WITH PULL MATCHES

Edwin H. Roth, 321 Rear Adelia St., Middletown, Pa. 17057

Filed Dec. 19, 1973, Ser. No. 426,354
Int. Cl. A24f *27/20, 27/00*
U.S. Cl. 206—98 22 Claims



1. A matchbook comprising

a paperboard comb having a plurality of matches, each match having an ignition head at one end and a pull tab formed at the other end, said plurality of matches being joined by tear portions adjacent the pull tabs,

a paperboard cover folded over the ignition heads of the paperboard comb and secured together on opposite lateral edges of the paperboard comb,

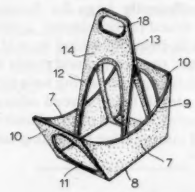
an igniting strip on the inside of the folded paperboard cover transverse to the plurality of matches and adjacent the other ends of the plurality matches, and

said paperboard cover having a plurality of tabs cut therein to extend longitudinally along portions of selected matches with portions of the cover tabs glued to the selected matches.

3,891,084
BASKET FOR THE CARRYING OF ALL TYPES OF BOTTLES

Javier Elizondo-Garcia, Monterrey, Mexico

Filed Mar. 15, 1973, Ser. No. 341,557
Int. Cl. B65d *1/38*
U.S. Cl. 206—143 3 Claims



1. A basket for carrying bottles forming deposit sections for holding bottles, comprising in combination,

a basket portion having a generally rectangular bottom portion from which extends as a unitary piece two side walls of generally trapezoidal shape and two diverging end walls of generally rectangular dimensions, thereby forming an upper opening larger than said bottom portion for receiving bottles therein,

bottom structure for supporting the bottles comprising two narrow transverse rectangular strips both united to said two side walls and each respectively united to one said end wall,

a handle portion attached to the center region of said bottom of the basket portion with two converging substantially vertical walls leading to a centrally disposed handle arranged between two bottle deposit sections for carrying the basket and

means in said end walls and said converging walls defining apertures on either side of said handle portion with contoured flanges closely fitting a predetermined bottle shape to hold it in place without play.

3,891,085
TOOTHBRUSH

Leon H. Boger, 2523 S.E. 71st Ave., Portland, Oreg. 97206

Filed May 15, 1973, Ser. No. 360,607
Int. Cl. B65d *79/00*
U.S. Cl. 206—229 1 Claim

1. A disposable toothbrush for one time use, said toothbrush comprising in combination,

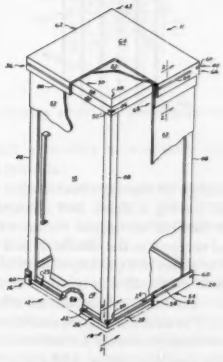
a main body including a tubular section of a compressible nature constituting a handle and adapted to store a quantity of dentifrice, said tubular section terminating at one end in a flattened portion to seal said one end, said main body terminating at its opposite end in a flattened head section interiorly coated with an adhesive for the purpose of retaining the head section in a flattened, sealed configuration, said tubular section of the main body defining an opening adjacent the head section for the discharge of the dentifrice from the tubular section upon the latter being manually compressed, and

tape mounted bristles affixed to said flattened head section to receive dentifrice from the discharge opening.

3,891,086
COMPOSITE PACKAGE

Jack L. Isaacs, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 17, 1974, Ser. No. 479,795
Int. Cl. B65d *15/00, 65/10, 85/30*
U.S. Cl. 206—320 6 Claims



1. A composite package, comprising:

a base element having first and second flanges and a base supporting a packaged item;

a top element having first and second top flanges and first flanges having notches;

a plurality of posts each having notches adjacent ends thereof and being positioned with one end contacting the base and the other end contacting a respective second top flange inwardly of the respective first top flange;

an organic material sheet encasing the base element, top element and posts, being shrunk thereabout, and forming a shrink-wrapped composite;

a bottom cap having a base element and a peripheral bottom cap flange and being positioned over the lower portion of the shrink-wrapped composite, said bottom cap flange having notches associated with the post notches;

first means extending into the notches of the posts and the bottom cap flange encompassing the bottom cap flange, and urging the posts toward the shrink-wrapped composite;

a top cap having a cap-top element and a flange having an infolded portion extending toward the bottom cap between adjacent posts forming a pocket opening in a direction toward the bottom cap, said peripheral flange having notches associated with the post notches; and

second means extending into the notches of the posts, top element, and top cap flange encompassing the flange of the top cap and urging the top cap flange toward the shrink-wrapped composite, said second means being positioned along a lower end portion of said pocket.

3,891,087

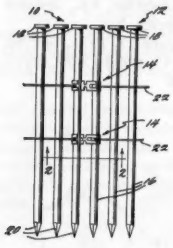
NAIL PACKAGE IMPROVEMENTS FOR INTERCONNECTING THE TRAILING NAIL OF ONE NAIL PACKAGE WITH THE LEADING NAIL OF ANOTHER NAIL PACKAGE

George A. Maynard, Coventry, R.I., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 217,461, Jan. 13, 1972. This application Aug. 15, 1973, Ser. No. 388,623

Int. Cl. B65d *85/24*

U.S. Cl. 206—346 **4 Claims**



1. In a nail package of the type including a multiplicity of similar nails, each having a shank and a round head on one end thereof, and flexible elongated means extending transversely across and secured to the shanks of said nails interconnecting the same in series in a packaged condition so that said nails are operable to be handled as a unit and positioned in an operative relation with a nail driving device wherein a trailing portion is supported in said packaged condition and a leading portion extends therefrom in row formation with the shanks thereof in generally parallel relation with respect to each other and with the leading nail in a driving position so that upon operation of the nail driving device successive leading nails are separately driven longitudinally from said driving position and the nails in said trailing portion are successively moved into said leading portion, the improvement which comprises in combination therewith coupling element means separate from said flexible elongated means for operatively connecting the trailing nail of said nail package when positioned in operative relation with the nail driving device with the leading nail of a similar nail package in a parallel relationship the same as the parallel relationship of the nails in said row formation so that the leading portion of said similar nail package is moved by said separate means into a similar operative relation with the nail driving device upon continued operation thereof.

3,891,088

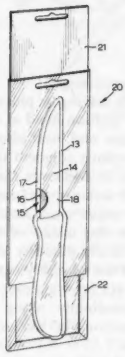
DISPLAY CARD FOR KNIVES AND THE LIKE

Karl Heinz Huebner, 9, Colonial Ave., Scarborough, Ontario, Canada

Filed July 30, 1973, Ser. No. 383,819

Int. Cl.[2] B65D *85/54*

U.S. Cl. 206—349 **8 Claims**



1. A package for displaying a cutting utensil having a cutting edge, comprising a generally flat backing piece and a transparent cover of relatively stiff material, said cover having a generally flat peripheral portion adjacent said backing piece and a raised generally central portion integral with said flat peripheral portion, said raised portion and said backing piece defining an enclosure sufficiently large for holding said cutting utensil therein; said raised portion having a side wall and a top section, a testing hole being provided in said raised portion and lying partly in said top section and partly in said side wall such that the edge defining said testing hole is nonplanar, said cutting edge of the utensil being placed adjacent said testing hole to allow diagonal movement of the thumb or finger across said testing hole and cutting edge for testing said cutting edge.

3,891,089

PEELABLE HEAT SEALS FOR PACKAGES

Charles C. Goodwin, Broadway; David L. Rounsaville, and James H. Grimm, both of Milford, all of N.J., assignors to Rexham Corporation, New York, N.Y.

Filed Aug. 1, 1972, Ser. No. 276,941

Int. Cl. B65d *81/20*

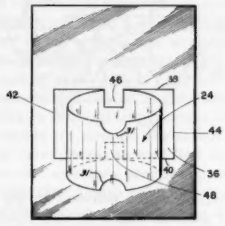
U.S. Cl. 206—439 **6 Claims**

1. A readily openable flexible package for use in containing objects which may be sterilized after sealing of the package, comprised of two layers in facing contact sealed only along a continuous peripheral seal to form said package, said seal being readily rupturable in the absence of destruction of the matrix of said layers, the combination consisting essentially of a first layer of paper and a second layer of ethylene-vinyl acetate copolymer film having a vinyl acetate content within the range of between about 9 and 28%, said first and second layers being heat sealed together in facing contact to form an object containing pocket.

3,891,090
ADHESIVE AND MECHANICALLY SECURED CARDED PACKAGE

William Spiegel, Southampton; Jacob Spiegel, Philadelphia, both of Pa., and Albert Miller, Somerdale, N.J., assignors to Gilbreth Company, Philadelphia, Pa.

Filed Jan. 10, 1973, Ser. No. 319,112
Int. Cl. B65d 73/00
U.S. Cl. 206—478 5 Claims

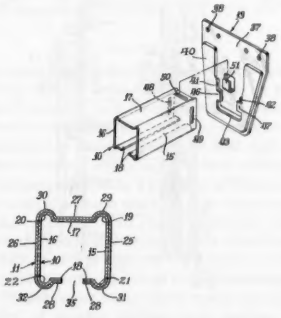


1. In a carded package comprising a card, a heat shrinkable tube adhesively affixed to the card and an article disposed within the tube and secured to the card by the tube, the improvement comprising first and second projections extending from the card and in contact with the article for enhancing the securement of the article to the card by enhancing the securement of the tube to the card, said tube including a first portion which is interposed between the first projection and the card and a second portion interposed between the second projection and the card, said projections being integral with the card, said card comprising a base portion to which said tube is adhesively affixed and one flap portion folded over said base portion, said flap portion including a window into which said first and said second projections extend such that the first portion of the tube is interposed between the first projection and said base portion and the second portion of the tube is interposed between the second projection and said base portion.

3,891,091
CLOSET ROD

William J. Anderson, Swor St. & Mayhaw St. P.O. Box 537, Taylorsville, Miss. 39168

Filed Oct. 25, 1973, Ser. No. 409,371
Int. Cl.[2] A47H 1/08, 1/142
U.S. Cl. 211—105.3 7 Claims



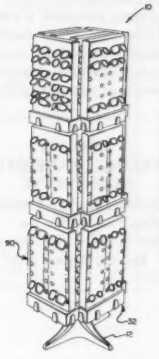
1. In a closet rod apparatus or the like comprising an extensible rod having devices at each end for supporting the rod, said rod comprising two telescoping members having relatively thin walls such as sheet metal, one member being inside the other member, the improvement comprising:

throughout the length thereof the walls of each member as seen in transverse cross-section comprising left and right straight and vertical side portions spaced from each other a given distance, a top horizontal portion centered between said side portions and at approximately the level of the tops thereof, a bottom horizontal portion centered between said side portions and at approximately the level of the bottoms thereof, the width of said top and bottom horizontal portions being less than said given distance, top externally convex portions connecting the tops of the side portions and the top portion, said convex portions extending above the top portion, bottom externally convex portions connecting the bottoms of the side portions and the bottom portion, said bottom externally convex portions extending below said bottom portion, all of said portions of said one member being in immediate juxtaposition to the corresponding portions of the other member.

3,891,092
SUNGLASS DISPLAY STAND

Richard H. Surrette, Hudson, and Alfred M. Braga, Fitchburg, both of Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.

Filed Aug. 22, 1973, Ser. No. 390,662
Int. Cl.[2] A47F 7/00, 5/02
U.S. Cl. 211—13 26 Claims



1. A rotary display stand for sunglasses comprising:
a pedestal;
an axial shaft extending substantially vertically upwards from said pedestal;
at least one rotary support member rotatably mounted on said axial shaft, said support member having opposing front and rear walls and a bearing portion supporting it on said shaft for rotation;
at least one holding member removably connected to one of said walls of said rotary support member; and
a sunglass display member removably supported by said holding member, said display member including means for removably displaying a plurality of sunglasses thereon.

3,891,093
CLAMPING DEVICE

Gordon D. Petrie, 11428 Snowdrop Ave., Fountain Valley, Calif. 92708

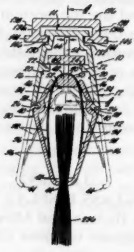
Filed Mar. 12, 1973, Ser. No. 340,443
Int. Cl. A47f 7/16
U.S. Cl. 211—46 16 Claims

1. A clamping device for holding sheet material comprising:
a support member having an upper portion and a lower portion;

a pair of clamp jaws pivotally attached to said lower portion of said support member and having a pair of interior flanges;

an actuator element slideably mounted within said support member and having a cam slot;

means located between said actuator element and said pair of clamp jaws for pivoting said pair of clamp jaws in



response to the slideable movement of said actuator element, said means for pivoting said pair of clamp jaws comprises a cam rod mounted below said interior flanges of said pair of clamp jaws and a cam blade attached to said cam rod, said cam blade having an inclined cam surface and slideably extending into said cam slot; and

means attached to said actuator element for controlling said slideable movement of said actuator element.

3,891,094

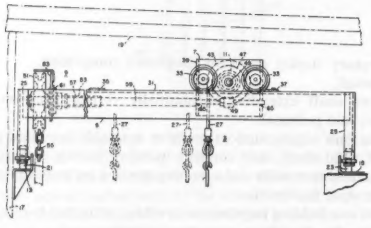
OVERHEAD TRAVELING CRANE WITH A TELESCOPIC HOIST DRIVE

John H. Angus, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,338

Int. Cl. B66c *17/00*

U.S. Cl. 212—20 **7 Claims**



1. An overhead traveling crane comprising a pair of elevated tracks, a horizontal frame extending between the pair of tracks, means comprising first wheels for moving the frame along the pair of tracks, a carriage supported on and movable along the frame, a winch journaled on the carriage and having a lifting cable having one end thereof wound around the winch and the other end depending therefrom, reversible means rotatably mounted in said horizontal frame for turning the winch and including a manually rotatable wheel and a telescopic rotatable shaft extending between the rotatable wheel and the winch, one end of the telescopic shaft being operatively connected to the winch, and the manually rotatable wheel being mounted on the other end of the telescopic shaft.

3,891,095

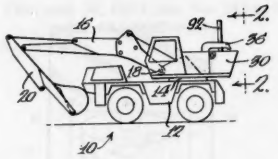
REMOVABLE COUNTERWEIGHT MOUNTING MECHANISM

William D. Symmank, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 22, 1974, Ser. No. 462,888

Int. Cl. B66c *23/72*

U.S. Cl. 212—48 **8 Claims**



1. In combination with a machine having a rotatable platform mounted thereon with a boom pivotally supported for movement about a horizontal pivot on said platform; a counterweight; means defining a recess in said counterweight; a permanent pin extending across said recess; means mounted on said platform for engaging said permanent pin; a bearing hanger on said platform adapted to be received in said recess, said hanger having an opening, said counterweight having end walls with a bore extending from one end wall across said recess, said bore having an enlarged portion adjacent said one end wall and a reduced portion extending across said recess; and removable pin means received into said bore and extending through said opening in said hanger for supporting said counterweight on said platform, said removable pin means including a pin portion corresponding in size to said reduced portion and a handle portion of a different size connected to said pin portion.

3,891,096

TRANSFERRING DEVICE FOR OBJECTS IN WHICH A REDUCED PRESSURE IS APPLIED CONTINUOUSLY

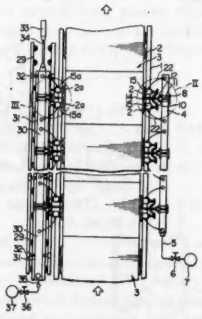
Hideto Terada, Toyokawa, Japan, assignor to Sintokogio, Ltd., Aichi-ken, Japan

Filed Mar. 22, 1974, Ser. No. 453,925

Claims priority, application Japan, Mar. 29, 1973, 48-35927; June 21, 1973, 48-73865

Int. Cl. B65g *25/08*

U.S. Cl. 214—1 BB **10 Claims**



1. A transferring device for objects in which a reduced pressure is applied continuously comprising a transporting means for advancing intermittently a plurality of said objects connected to one another in single file in the direction of said file; a first normally closed valve means provided on one side of each said object and adapted to apply the reduced pressure

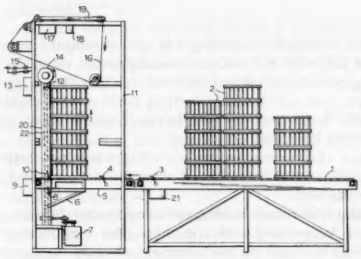
in each said object; a second normally closed valve means provided on the other side opposite to said one side of each said object and adapted to apply the reduced pressure in each said object; a first normally closed push valve means provided substantially in parallel relation to said file and along said one side of each said object and adapted to connect to and communicate with said first normally closed valve means of the predetermined numbers of said objects in which the reduced pressure is to be applied thereby connecting said predetermined numbers of them to a vacuum source; a second normally closed push valve means provided substantially in parallel relation to said file and along said other side of each said object and adapted to move along and in parallel to said file when said objects advance for connecting to and communicating with said second normally closed valve means of the predetermined numbers of said objects thereby connecting them to a vacuum source; a first operating means which operates only when said objects are stopped to connect said first normally closed push valve means to said first normally closed valve means; a second operating means adapted to connect said second normally closed push valve means to said second normally closed valve means and to release this connection only when said first operating means is operating; and a restoring means for restoring said second normally closed push valve means which have moved with the advance of said objects to the original position from which said second normally closed push valve means started to move.

3,891,097

CHICKEN COOP UNSTACKING MACHINE

Albert D. Shackelford, Athens; John H. Holladay, Winterville, and E. J. Lloyd, Athens, all of Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 6, 1973, Ser. No. 376,973
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 H **2 Claims**



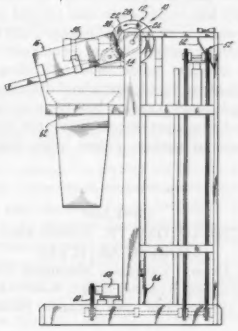
1. An apparatus for transporting tiered rectangular solids from external to internal areas of warehousing or processing plants therein to unstack each transported tier, the apparatus comprising a tower structure for providing support and rigidity to all components and containing a first and a second horizontal feed conveyor which support and convey a stack-at-a-time of reactangular solids; a plurality of limit switches to provide limit control to each stack as it is being transported horizontally and vertically; a lift platform, driven vertically by a vertically positioned ball bearing screw (jackscrew), the function of which platform being to lift a stack to a predetermined elevation therein to discharge the top rectangular solid from the top of each stack horizontally upon making contact with a plurality of moving springloaded endless conveyor elements; a plurality of springloaded endless conveyor elements which yield slightly to the upward force of the elevating stack of rectangular solids thereby providing the time-lapse and yielding quality required for overcoming the inertia of the topmost rectangular solid; the said endless conveyor elements being located near the top of the tower support structure and providing the force required to expel each solid as it comes in contact with and under the endless conveyor elements a plurality of discharge wheels the laterial traveling movement of said endless conveyor elements assisted in the expelling of the topmost rectangular solid by the complementing rotational movement of said plurality of discharge wheels onto and over which each rectangular solid is driven; and power means for energizing the forward, reverse, and repositioning motions of the conveyors, feed discharge wheels, the lift platform, endless conveyor elements, and said limit switches.

3,891,098

APPARATUS FOR INVERTING CONTAINERS

Andrew T. Koch, 1 Upper Mountain Ave., Montclair, N.J. 07042

Filed Oct. 5, 1973, Ser. No. 403,777
Int. Cl. B65g *59/02*
U.S. Cl. 214—8.5 H **7 Claims**



1. In an apparatus for individually removing and thereafter inverting containers or the like having opening means therein from a stack of such containers, including means for delivering said stack of said containers to a work station and means for receiving the inverted containers from the work station, an improved de-stacking and inverting mechanism at the work station which comprises:

rotating drum means having a generally cylindrical surface positioned so as to approximately peripherally contact one side of the uppermost container in said stack of containers delivered thereto;

projection means fixedly mounted to said cylindrical surface of said drum means for rotation therewith,

said projection means being mounted at an angle of approximately 45° to said cylindrical surface and inclined outwardly therefrom in the direction of rotation of said drum means; and

said projection means adapted to extend through said opening means in said uppermost container upon rotation of said drum means to thereby releasably engage said uppermost container between said projection means and said cylindrical surface of said drum means,

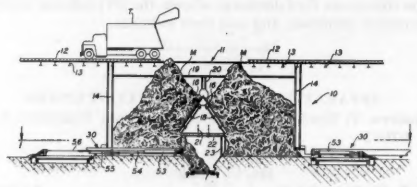
whereby said drum means removes said uppermost container from said stack and thereafter rotates said uppermost container therewith for delivery and release to the receiving means in an inverted position.

3,891,099

MATERIAL STORAGE AND TRANSFER DEVICE

Gordon C. Smith, Richfield, Ohio, assignor to Glaus, Pyle, Schomer, Burns and DeHaven, Inc., Akron, Ohio

Filed Jan. 31, 1974, Ser. No. 438,342
Int. Cl. B65g 65/44
U.S. Cl. 214—17 DA 12 Claims



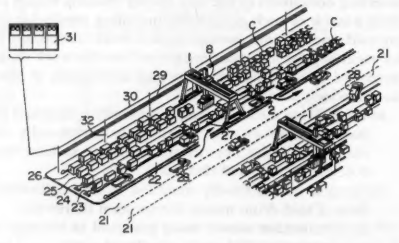
1. A material storage and transfer system comprising, storage means extending in a longitudinal direction for receiving quantities of material, conveying means extending in said longitudinal direction receiving material from said storage means and transferring the material out of said storage means, means to transfer the material from said storage means to said conveying means, said means to transfer including at least one pusher assembly located at each side of and outside of said storage means when in a retracted position and movable laterally into said storage means when in an extended position, and a plurality of adjacent guide means dividing said storage means into bays along said longitudinal direction, said pusher assembly being located within a bay between adjacent guide means thereby being operable to move the material to said conveying means at various points along said longitudinal direction.

3,891,100

STORAGE WITH AUTOMATIC HANDLING MEANS FOR STORING ARTICLES

Mituo Tamaki, Urawa; Yasumasa Ninomiya; Tatsuo Koyama, both of Tokyo, and Ryouhei Ishige, Kashiwa, all of Japan, assignors to Hitachi, Ltd. and Japanese National Railways, Japan

Filed Oct. 12, 1973, Ser. No. 405,900
Claims priority, application Japan, Oct. 18, 1972, 47-103569
Int. Cl. B65g 67/10
U.S. Cl. 214—38 CA 5 Claims



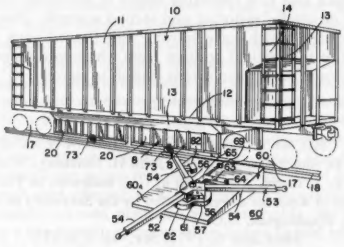
1. A storage for storing articles comprising track for a freight car unit consisting of a plurality of freight cars each carrying articles spaced from each other by a predetermined distance, each of said freight cars having a detected element, a plurality of fixed points disposed on the ground along said track and spaced from each other by a predetermined distance so that each fixed point corresponds to an individual freight car, an article storing area consisting of a plurality of article storing spots disposed along said track and positioned relative to said fixed points, means for detecting relative displacement of said fixed points and the standing position of the corresponding ones of said freight cars, said detecting means including means for recognizing each said detected element, means for temporarily memorizing the displacement, and an automatic crane means for carrying out loading and unloading of desired articles between said freight cars and said article storing area according to instructions from said memorizing means.

3,891,101

HOPPER CAR DOOR CLOSURE IMPROVEMENT

William H. Peterson, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed June 24, 1974, Ser. No. 482,733
Int. Cl. B61d 7/30
U.S. Cl. 214—63 12 Claims



1. For a hopper car having a hopper positioned between a pair of side sills and door means supported on said car for hinging movement on longitudinal axis parallel to said sills from an open substantially vertical position to a closed substantially horizontal position beneath said hopper, the improvement comprising:

a door closing mechanism including a support stationarily positioned to one side of a track on which said car is positioned,

closing arm means having actuating means thereon,

means supporting said arm means for pivotal movement about an axis on said support whereby said actuating means is movable in a generally circular path around said axis,

engageable means on said door means,

means positioning said arm means whereby said actuating means is in actuating position to engage said engageable means on said door means when said car is moved on said track alongside said support thereby rotating said arm to provide a lateral force moving said door means inwardly to a closed position,

means urging said arm means again into said actuating position,

said arm means including a plurality of radially extending arms spaced from one another arcuately,

each arm having a movable resiliently supported end portion for selective engagement with said engageable means,

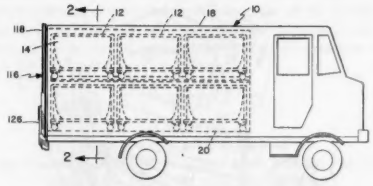
stop means mounted on said support and limiting circular movement of said arm means, and

said stop means being positioned on said support for abutting engagement with said arm means to prevent its movement in a circular path when said arm means is in position for engagement with the associated engageable means.

3,891,102
VEHICLE LOADING AND STORAGE SYSTEM FOR WHEELED CONTAINERS

Bobby J. Blount, 530 La Rue Way, El Cajon, Calif. 92021

Division of Ser. No. 126,136, March 19, 1971, Pat. No. 3,752,336. This application Mar. 7, 1973, Ser. No. 338,839
Int. Cl. B60p 1/44
U.S. Cl. 214—75 T 4 Claims



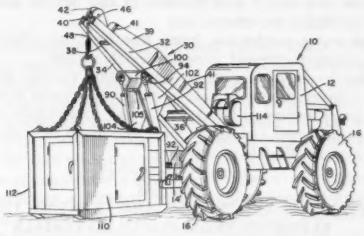
1. A vehicle loading and storage system for loading and storing containers within the body of a vehicle comprising:
- track means for storing at least one additional level of containers above a level of containers supported on the floor of said vehicle body;
- elevator means for raising containers from at least the floor level of said vehicle to said additional level;
- said track means having at least one row;
- each of said rows being capable of supporting a plurality of containers;
- said track means having a supported position and a stowed position;
- said stowed position making substantially the entire interior of said vehicle open for cargo;
- at least one of said track means is retained in said supporting position by a plurality of vertical members removably secured to an overhead bar mounted along the roof of said vehicle;
- at least one track of said track means is supported in said stowed position by said plurality of vertical members removably secured to at least one overhead bar mounted along the roof of said vehicle adjacent at least one side thereof;
- said track means comprise at least one pair of channels;
- the first channel in said pair being carried by a side wall of said vehicle body;
- and the second channel in said pair being carried by said vertical member,
- said vertical members are prevented from side to side movement within said vehicle body when in said supporting position, by a retainer mounted on the floor of said vehicle.

3,891,103
HEAVY EQUIPMENT HANDLER

James E. Harris, and Patrick E. Regan, c/o Legal Dept., The Anaconda Company, both of Butte, Mont. 59701

Filed Nov. 2, 1973, Ser. No. 412,408
Int. Cl. B60p 1/50
U.S. Cl. 214—75 H 1 Claim

1. In combination, a vehicle including a chassis, hoist means mounted on said chassis for lifting an article, said hoist means comprising an elongated boom including a pair of side members, a pair of support members, one of said support members being mounted on one side of said chassis and the other of said support members being mounted on the other side of said chassis, both support members having a portion extending above said chassis, means for pivotally mounting one end of each of said side members to said upper extending portions of respective ones of said support members, a pulley, each of said side members extending relative to the other in converging relation toward an apex, means connecting said converged ends of said side members and said pulley, winch means mounted on said chassis, said winch means including a cable having securing means at one end and connected at the other end to a drum of said winch means, said cable being trained over said pulley to be let out and drawn up by said winch means, pressure responsive means including at least one pressurizable cylinder and a pressure responsive member carried by and movable relative to said cylinder, said pressure responsive means connected between said chassis and said elongated boom and controlled to cause said side members to pivot about said support members so that pivotal movement of said elongated boom in concert with operation of said winch means will result in movement of said article through space, protection means carried by said elongated boom, said protection means including at least one plate cooperable with each

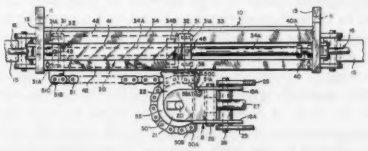


pressure responsive means, each plate extending from said elongated boom in a plane substantially perpendicular to a plane including said pivot points, each plate extending outwardly of said elongated boom beyond the disposition of said pressurizable cylinder for protecting the same against contact by said article when lifted, and a support frame for supporting said article, said support frame including a pair of spaced parallel arms, an element connecting said arms at one end, positioning means on said support frame providing abuttments against the movement of said supported article on said support frame, said support members having a portion extending below said chassis, and means mounting said support frame to said chassis so that said arms extend rearwardly thereof and in alignment with movement of said boom, said mounting means including a lower extending portion of said side members connected to said spaced arms.

3,891,104
SWING MECHANISM FOR EARTH-MOVING APPARATUS

John S. Pilch, Ware, Mass., assignor to Ware Machine Service, Inc., Ware, Mass.

Filed Apr. 11, 1974, Ser. No. 459,920
Int. Cl.[2] B66F 9/14
U.S. Cl. 214—132 13 Claims



1. In swing mechanism for an earth-moving apparatus comprising,
- a main frame adapted to be carried by a vehicle,
- swing frame means, and
- substantially vertical pivot means connecting said main frame and said swing frame means for swinging move-

ment of said swing frame means about said substantially vertical pivot means,

the improvement comprising,

a single, double-acting ram-type hydraulic motor means, comprising a portion having a cylindrical bore and a piston rod having at least one end supported by at least one laterally spaced member of said main frame,

a pair of elongate flexible means, one end of each of said flexible means being attached to said swing frame means, the other end of one of said flexible means being attached to said portion having a cylindrical bore adjacent to one end thereof and the other end of the other of said flexible means being attached to said portion having a cylindrical bore adjacent to the end thereof,

means on the main frame and on said portion having a cylindrical bore for guiding said portion having a cylindrical bore and at least portions of said flexible means for rectilinear movement, and

said swing mechanism being free from any sheaves for coaction with said elongate flexible means,

whereby rectilinear movement of said portion having a cylindrical bore by said motor means causes said swing frame means to swing about said substantially vertical pivot means and longitudinal movement of both of said elongate flexible means.

3,891,105

SYSTEM FOR RECOVERING AND TREATING USEFUL ELEMENTS FROM WASTE MATERIALS

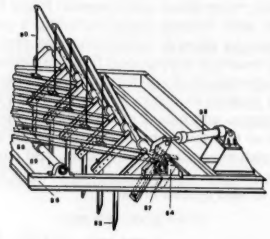
Manlio Cerroni, Via Bruxelles 53, Rome, Italy

Filed May 9, 1973, Ser. No. 358,516

Claims priority, application Italy, Feb. 22, 1973, 48411/73; Apr. 20, 1973, 49595/73

Int. Cl. B65g *65/04*

U.S. Cl. 214—305 **4 Claims**



1. Device for use in the recovery and treatment of useful substances contained in solid urban wastes where the wastes are contained within bags formed of a tearable material, such as plastic, paper, or combination of plastic and paper, comprising means for moving the bags filled with solid urban wastes along a path of travel, a frame located above the path of travel, means for supporting the frame and for moving it into the path of movement of the bags on said moving means, laterally spaced spikes fixedly secured to said frame and arranged to depend from the frame into and across the path of movement of the bags for blocking movement of the bags, and knives dependently and movably supported on said frame for performing a cyclic oscillating movement, said knives arranged in laterally spaced relationship for depending into and across the path of movement of the bags, in each cycle of movement said knives are initially spaced upstream from said spikes relative to the path of travel of the bags and moved toward and past said spikes effecting a tearing action on the bags held by said spikes and exposing the material within the bags, said knives spaced laterally relative to said spikes and effecting a scissors-like action therebetween as they pass said spikes, and then reversing direction and moving in the direction opposite to the movement of the bags on said moving means and through the bags and material therein to the initial position.

3,891,106

DETACHABLE TRASH BOX AND TRAILER

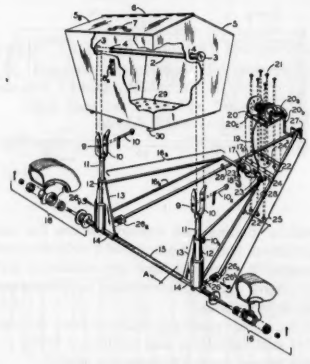
Eduardo V. Alcanzare, 27 San Miguel St., Kapitolyo, Pasig, Rizal, Philippines

Continuation of Ser. No. 321,919, Jan. 5, 1973, abandoned. This application Nov. 23, 1973, Ser. No. 418,775

Claims priority, application Philippines, Jan. 6, 1972, 13160

Int. Cl. B65g *65/04*

U.S. Cl. 214—318 **12 Claims**



1. A trailer for lifting and transporting a container comprising, in combination, an axle; wheel means mounted on said axle for rotation; frame means attached to said axle and having a trailer hitch; support means mounted on said axle so as to be displaceable between an engaging position and a lifted position and operative for tiltably engaging the container and lifting the same; and single means for moving said support means between said engaging and said lifted positions thereof whereby to lift the container, for holding said support means and the container in said position, and for tilting the container into a dumping position thereof with said support means being in said lifted position whereby to discharge the contents of the container, said single means further being connectable to the container at two distinct locations, one of said distinct locations being used for said holding and the other being used for said dumping, and said single means further being connectable to said support means for said lifting.

3,891,107

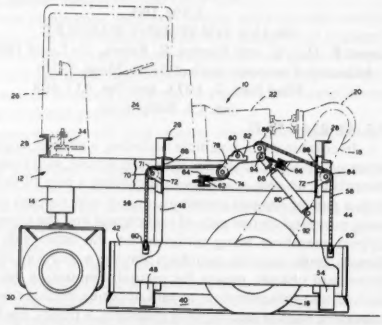
STRADDLE CARRIER LIFTING MEANS

Glen W. Burgess, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed June 20, 1974, Ser. No. 481,021

Int. Cl. B60p *3/00*

U.S. Cl. 214—392 **2 Claims**



1. In a straddle carrier having a pair of load hooks located at opposite sides in the bay thereof, means for lifting at least

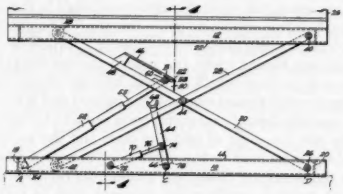
one of said load hooks which comprises a single bell crank mounted for pivotal movement from one side of the carrier at a location above and intermediate the ends of said load hook, first sheave or sprocket wheel means mounted at each end of the bell crank, second sheave or sprocket wheel means mounted from said one side of the carrier above each end portion of said load hook, first and second cable or chain means each secured to the one side of the carrier and to the respective end of the one load hook and reeved on said first and second sheave or sprocket wheel means, and a single actuator cylinder connected to the one side of the carrier and to one end portion of the bell crank for actuating the bell crank and cables or chains on said sheave or sprocket wheel means for lifting the one load hook.

3,891,108

HIGH LIFT MECHANISM

Charles Traficant, 1350 N.W. 42nd Ave., Miami, Fla. 33126

Filed Feb. 14, 1973, Ser. No. 332,516
Int. Cl. B60p *1/02*
U.S. Cl. 214—512 **8 Claims**



1. A high lift mechanism, for mounting on a truck chassis, to move a cargo body fixed thereto between a retracted, down position and an elevated position comprising,

A. a lower frame for fixed engagement with the truck chassis;

B. an upper frame to carry the cargo body threatop;

C. lever means interconnecting said frames comprised of,

1. a first combination of levers, and

2. a second combination of levers;

D. fluid actuated ram means for moving said upper frame between said positions;

E. means to drivingly engage the extended end of said ram means to said first combination of levers to elevate said upper frame to a predetermined, intermediate, level, in a first phase operation, when pressurized fluid is delivered to said ram means;

F. means to disengage said means to engage from said first combination of levers at said intermediate level and to simultaneously engage same with said second combination of levers to elevate said upper frame to its maximum elevated position in a second phase of operation;

said interconnecting lever means includes a pair of scissors type lift levers interconnecting each of the respective sides of said upper and lower frames and a link means pivotally attached at a first end to said lower frame, intermediate the opposed ends of said scissors levers; said scissors levers and link means comprising said first combination of levers and said scissors levers comprising said second combination of levers;

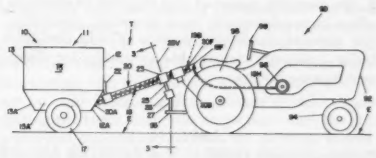
said means to drivingly engage comprises a bearing plate, fixed to and spanning a portion of one corresponding pair of said scissors levers, and a yoke means at the second end of said link means to receive a tip end portion of said ram; said bearing plate being sized and positioned to maintain said tip end portion in said yoke through said first phase of operation during which forces are directed upwardly by the movement of the ram and the resulting pivotal movement of said link means.

3,891,109

WAGON WITH ELONGATE CONVEYOR HOUSING AS UNLOADER AND DRAYAGE HITCH

Carroll G. Olson, Rural Rt. No. 1, Atkinson, Nebr. 68713

Filed Sept. 19, 1974, Ser. No. 507,564
Int. Cl.² B60P *1/40*
U.S. Cl. 214—519 **7 Claims**



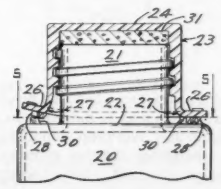
1. In combination with an overland tractor vehicle, a cargo-carrying rollable wagon having a cargo-storage compartment and including an elongate forwardly and upwardly extending power actuated conveyor lying along a vertical plane and having a rearward intake-end communicating with the wagon at the bottom front portion of the cargo-storage compartment and a forward discharge-end, said conveyor being provided with an external tubular housing connected to the wagon and also including a forward outlet spout depending from the housing adjacent the conveyor discharge-end, said conveyor tubular housing nearer the outlet thereof than to its rearward wagon connection havi. g means for being removably pivotably attached to the tractor hitch for towing purposes, said means including a revolvable stud depending from the housing and lying along the hitch-axis and providing the pivotal connection to the forward tractor means.

3,891,110

CHILD-RESISTANT CLOSURE FOR A CONTAINER HAVING A THREADED NECK

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 15, 1973, Ser. No. 406,676
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—216 **8 Claims**



1. A substantially leak-proof and child-resistant closure combination, said combination comprising,

a. a container having a tubular neck, a hollow body and a generally inwardly extending shoulder between the upper portion of said body and the base of said neck,

b. a one-piece cap for said container, said cap having a disc-like top and a tubular skirt,

c. cooperating threads on said neck and said cap skirt for retaining said cap on said neck,

d. circular sealing means on the interior of said cap and engageable with said tubular container neck for sealing said container neck when said cap is in normal closed position on said container,

e. and cooperating child-resistant locking means on said cap and said container shoulder engageable when said cap is rotated at least to normal closed position relative to said

container neck, said child-resistant locking means consisting of

f. a plurality of circumferentially spaced radially extending first elements integral with and at the lower margin of said cap skirt and

g. a circumferentially extending plurality of opposed elements formed on said container shoulder and engageable with said neck to at least normal closed position thereon,

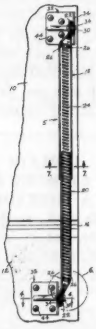
h. the elements in one of said plurality of elements being offset circumferentially from diametric opposition,

i. the element-comprising portion of said container skirt being resiliently deformable upwardly for disengaging said locking means.

3,891,111
SPRING BIASED PROP FOR A PIVOTED MEMBER

Vladimir R. Snazuk, Britt Ave., Rt. 6, Box 135, Elkhart, Ind. 46514

Filed Oct. 11, 1973, Ser. No. 405,254
Int. Cl.[2] B65D *43/24*
U.S. Cl. 217—60 F **4 Claims**

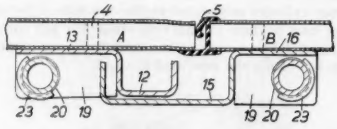


1. A prop for a pivoted member, said pivoted member being connected to a support part by hinge means and being pivotal about a horizontal axis, said prop comprising inner and outer telescopically interfitting tubular members, each tubular member having an outer end, a helical spring having opposite ends and fitting longitudinally within said tubular members, means anchorine one end of said spring to said inner tubular member inwardly from the outer end thereof, means anchoring the other end of said spring to said outer tubular member inwardly from its outer end, said tubular members being shiftable telescopically between an extended position wherein said spring is in an expanded state and a retracted position wherein said spring is in a compressed state, means pivotally anchoring one tubular member outer end to said pivoted member spaced from said horizontal axis, means pivotally anchoring the other tubular member outer end to said support part spaced from said horizontal axis, said spring constituting means for urging said tubular members from their retracted position into their extended position and supporting said pivoted member in a raised position, both said spring anchoring means constituting a pair of tab parts formed in said side wall of each tubular member, each pair of tab parts being bent into the interior of the tubular member in an opposed relationship interlocking with said spring between the turns thereof.

3,891,112
DOORS FOR CONTAINERS AND THE LIKE

Peter Lycett, and Kenneth William Kempson, both of Staffordshire, England, assignors to The Bloxwich Lock and Stamping Company Limited, Staffordshire, England

Filed Oct. 3, 1972, Ser. No. 294,541
Int. Cl. B65j *1/02;* **B65d** *7/48;* **E05c** *7/00*
U.S. Cl. 220—1.5 **5 Claims**

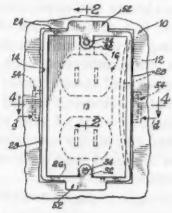


1. A freight container in which one end of the container is closed by two co-operating doors hinged at their vertical outer edges to sides of the container and the free edges of the doors are provided with first and second reinforcing members of channel cross-section of which one fits within the other in the closed position of the doors, wherein the said reinforcing members are separately formed members secured to the doors adjacent to their free edges and extending the full height of the doors, each reinforcing member comprising a portion of channel cross-section having a web and spaced parallel flanges and an attachment portion which extends laterally from one of said flanges parallel to said web and lies against and is secured to a door, and the first of said members is secured to one door adjacent to the free edge of said one door and the second of said members is secured to the other door in such a position that when the doors are closed the channel-section portion of said second member overlaps the adjacent edge of said one door to receive the channel-section portion of said first member, each of said reinforcing members incorporating abutment means, the abutment means of one reinforcing member being engageable with abutment means of the second reinforcing member to prevent relative vertical movement of the free edges of the doors when they are in closed position and the channel section portion of said first member is engaged within the channel-section portion of said second member.

3,891,113
ELECTRICAL BOX

George Salg, River Forest, Ill., assignor to Reflect-O-Lite Manufacturing Company, Chicago, Ill.

Filed Nov. 9, 1973, Ser. No. 414,385The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.
Int. Cl.[2] H02G *3/08*
U.S. Cl. 220—3.6 **7 Claims**



1. A molded plastic, hollow electrical box adapted to be inserted in an opening in a wall panel and to be secured thereto without extraneous fasteners, said box being a integral, one-piece structure and comprising an integral back wall and a sidewall forwardly of said back wall and forming with said back wall an open box structure defining an expansive

open front forwardly of said back wall and circumscribing a hollow space therewithin, a plurality of knock-out portions formed with said box along weakened lines of connection, and an integral wall panel mounting means comprising panel face contactors for controlling the depth of entry of said box structure when it is inserted through a wall panel opening from the front of said wall panel into the space behind the wall panel and for engaging the front face of said wall panel when the box is secured to said wall panel, said mounting means further comprising panel locking means mounted on, and integral with a portion of the sidewall of said box and spaced rearwardly of said contactors and laterally away from said contactors and providing a front edge for engaging the back surface of said wall panel when the box is secured to said wall panel, said panel locking means merging with said sidewall and said sidewall being continuous, and without breaks or slits in said sidewall portion adjacent said panel locking means, said panel locking means and said contactors extending outwardly of said box and away from said hollow space, said locking means being positioned to be cammed inwardly of the hollow space and to flex the portion of the sidewall carrying said locking means in a region remote from said contactors and without flexing the sidewall portions located at said contactors inwardly of the hollow space as said box is inserted into and pushed through said wall panel opening and then resiliently to be moved outwardly when said contactors have engaged the front face of said wall panel, said locking means defining a forwardly and outwardly sloping camming surface to engage the periphery of said wall panel opening so that as said box is pushed through said opening said locking means will cause the portion of said sidewall carrying said locking means to be deflected inwardly of said hollow space, said locking means being proportioned and positioned to return to an original position outwardly of said hollow space so that said front edge is positioned behind said panel to prevent removal of said box forwardly of said wall panel opening, so that when a wall panel is disposed between said contactors and said locking means, said box may not readily be moved either inwardly or outwardly of said wall panel.

3,891,114
SEALING COVER WITH PRESSURE COMPENSATION CHANNEL

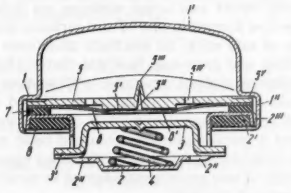
Theo Gerdes, Langenfeld, Rhineland, Germany, assignor to Blau K. G. Fabrik Fuer Kraftfahrzeugteile, Langenfeld, Rhineland, Germany

Filed Sept. 13, 1973, Ser. No. 397,093

Claims priority, application Germany, Sept. 29, 1972, 2248033

Int. Cl. B65d *51/16*

U.S. Cl. 220—209 **5 Claims**



1. In a sealing cover for closing a container adapted to contain a mixture of liquids and gases, particularly fuel storage tanks or the like, a combination comprising a housing defining an enclosed space; wall means provided within said housing and subdividing said enclosed space into a first compartment adapted to communicate with the ambient atmosphere and a second compartment adapted to communicate with the container, said wall means being formed with a centrally located projection extending into said second compartment and with an outer portion having a plurality of apertures extending therethrough; a flexible pretensioned diaphragm provided within said housing and having an outer marginal portion overlying said outer portion of said wall means defining an annular space therewith which communicates with said apertures and an inner marginal portion overlying said centrally located projection and normally sealingly engaging the latter and bounding a center opening of said diaphragm; a groove-shaped channel formed in said projection and having an inlet communicating with said second compartment by means of said central opening in said diaphragm and dimensioned to allow entry of gas but to substantially restrict the entry of liquid into said channel, said channel having at least one outlet communicating with said annular space, whereby a force is exerted on said inner marginal portion of said diaphragm disengaging the latter from said projection when the pressure of the ambient atmosphere exceeds the pressure in said container so that the atmosphere may be admitted via said second compartment into the container, and an oppositely directed force is exerted on said inner marginal portion to urge the latter against said projection when the pressure in said container exceeds the pressure of the atmosphere so that the gaseous component of said mixture may enter said groove-shaped channel for discharge to the ambient atmosphere, whereby the pressure in said container may be automatically equalized.

3,891,115
WASTE PAPER CONTAINER

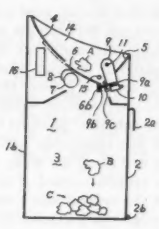
Taiichi Ono, 4-88 Biwajima-dori, Nishi-ku, Nagoya-shi, Japan

Filed July 11, 1973, Ser. No. 378,058

Claims priority, application Japan, July 12, 1972, 47-82300; July 12, 1972, 47-82301; July 14, 1972, 47-70932

Int. Cl. B65f *1/16*; **B65d** *43/26*

U.S. Cl. 220—260 **3 Claims**



1. A waste material container comprising:

a body made of sheet material having a top portion and a hollow inner portion wherein crumpled waste material can be collected;

a valley shaped recessed portion defined by a pair of oppositely disposed slants in said top portion and a pair of oppositely disposed substantially vertical walls disposed adjacent said slants, said slants and said walls further defining a lower extremity of said recessed portion;

a photo electric element disposed in substantially said lower extremity of said recessed portion and including a light projector and a photo-electric receiver, said projector continuously projecting a beam of light at said receiver;

a door disposed in one of said slants, said door being normally closed;

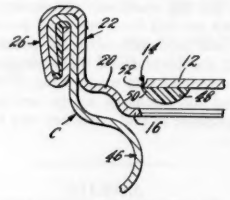
a door operating means to open said door upon interruption of said beam of light by said waste material and to close the door after said waste material has entered said hollow inner portion; and

said door operating means including:

a blind, pivotally mounted on one of said substantially vertical walls, said blind being pivoted in conjunction with the opening of said door thereby interrupting said beam of light when said door opens, but before said waste material enters said hollow inner portion,

a driving means for opening said door in response to the interruption of said beam of light, said driving means being operative to open said door a predetermined amount as long as said beam of light is interrupted, and releasing means releasing said door after said door is opened said predetermined amount thereby allowing said door to close under the weight thereof.

3,891,116
FULL-OPEN EASY-OPEN CONTAINER
Alvin Mansfield Schane, Elmhurst, Ill., assignor to American Can Company, Greenwich, Conn.
Filed Dec. 14, 1972, Ser. No. 315,088
Int. Cl. B65d *41/32*
U.S. Cl. 220—270 **1 Claim**

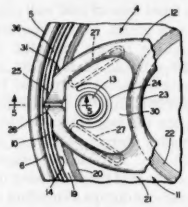


1. In a metal easy-opening container of the type wherein a full-open end closure is double seamed to a container body, wherein the end closure includes a perpheral countersink wall, a full-open removable central panel section defined by a full-open score line adjacent the countersink wall and having a land portion, and an opening tab secured to the central panel near the score line so that the tab nose can rupture the score to leave a central panel rim between the countersink wall and the score, and wherein the container body sidewall has a radially inwardly-protruding annular bead underlyingly adjacent the central panel score to protect the rim edge once the score is ruptured, the improvement which comprises:

a substantially semi-spherical plastisol bead adhered to the undersurface of the removable full-open central panel section adjacent and along the score, said bead having its thickest portion radially inward of the score and at least the thickness of the central panel, and said bead having an outer radial edge which extends to but not beyond the outer radial edge of the score land portion such that the bead does not interfere with the downward arcuate path of the tab nose during its rupturing of the score, the thicknesses of the central panel section and bead which remains adhered thereto, in combination, providing a blunt edge which protects the edge of the removable panel section once the score is ruptured.

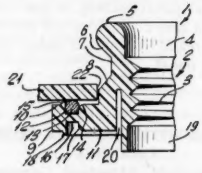
3,891,117
EASY-OPENING CAN END CONSTRUCTION
John D. Dragomier, and Edgar H. Zysset, both of Canton, Ohio, assignors to Van Dorn Company, Cleveland, Ohio
Filed May 24, 1974, Ser. No. 473,009
Int. Cl. B65d *17/20*
U.S. Cl. 220—270 **9 Claims**

1. In a metal can end member for an easy opening metal can of a type in which the can end is adapted to be seamed to the can, in which the end member has a removable panel portion having a hazard-eliminating protective endless annular triple metal fold formation defined by a main score line, in which a pull ring is connected by rivet means to the removable panel portion, and in which the pull ring has a nose overlying the score line with the axis of the pull ring which passes through the rivet means and nose extending radially of the end member; the improvement including angularly arranged reinforcing control beads located beneath and covered by the pull ring and having inner and outer ends formed in the removable panel portion, one on either side of the rivet means; the control beads diverging inward with respect to the panel center from the outer bead ends located outboard of the rivet means and adjacent the triple fold formation to inner bead ends



located inboard of and spaced a considerable distance from the rivet means; and the triple fold formation having a relieved Z-shaped fold zone extending beneath and to either side of the pull ring nose and having ends located adjacent the outer bead ends.

3,891,118
PLASTIC BONDED CLOSURE
Jeremiah J. Laurizio, New Providence, N.J., assignor to American Flange & Manufacturing Co., Inc., New York, N.Y.
Filed July 2, 1973, Ser. No. 375,451
Int. Cl. B65d *41/04*
U.S. Cl. 220—288 **2 Claims**



1. A closure flange molded of synthetic plastic material adapted for thermoplastic bonding to a plastic container wall opening, comprising an upstanding cylindrical neck, a screw thread formed on the interior of said neck, pilot means formed on said neck for centering said flange within a container wall opening, a laterally extending annular collar surrounding said neck having upper and lower surfaces, an axially opening annular groove formed in one of said surfaces spaced radially outwardly of said neck, an electrical conductor element retained within said groove to facilitate thermoplastic bonding of said collar to a plastic container wall section surrounding said opening, an annular protrusion positioned radially outwardly of said conductor extending axially away from said groove and a circumferentially enlarged bead at the uppermost end of said cylindrical neck displaced completely radially inwardly of said groove and adapted to receive an overlying tamperproof cap seal.

3,891,119
MANHOLE COVER LOCK
Edward W. Hunter, Port Franks, Canada, assignor to Emco Limited, London, Canada
Filed June 24, 1974, Ser. No. 482,744
Int. Cl. B65d *45/16*
U.S. Cl. 220—324 **2 Claims**

1. A closure for a tank opening with an inwardly directed circumferentially extending catch flange comprising

a cover adapted to seat over said opening, said cover having a filling passage and a vent passage therethrough,

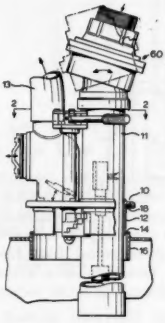
at least one latch shaft mounted on said cover for accessibility on the upper side of said cover and extending downwardly to the underside of said cover,

said latch shaft being mounted on said cover as aforesaid for movement longitudinally of its longitudinal axis and for movement of rotation about its longitudinal axis,

yieldable resilient means urging said latch shaft longitudinally of itself and towards the underside of said cover,

a latch extending radially of said latch shaft and having a series of locking flats in echelon arrangement, each locking flat being separated from its neighbouring locking flat by a shoulder,

said latch shaft being mounted for rotation as aforesaid adjacent the edge of said cover and said series of locking flats being formed on said latch to cause the locus of the



shoulder of each locking flat to cross the downward projection of the marginal portion of said cover in succession starting with the shoulder at the lower most locking flat as the shaft is rotated,

a release-turn lever pivotally mounted adjacent the upper end of said latch shaft about an axis transverse to the longitudinal axis of said latch shaft and having a gripping end and a bearing end,

a reaction surface on said cover for the bearing end of said lever,

said gripping end of said lever being manually depressible to move said latch shaft downwardly against said yieldable means and being turnable to rotate said latch shaft about its longitudinal axis,

said cover having a peripheral seal on its underside,

said locking flats being adapted in use to engage with the inwardly directed flange of a manhole through manipulation of said release-turn lever.

3,891,120

OPERATION MONITOR FOR AIR PRESSURE TYPE SEED PLANTER

Leo J. Loesch, and Claude E. Loesch, both of Kimball, Minn. 55353

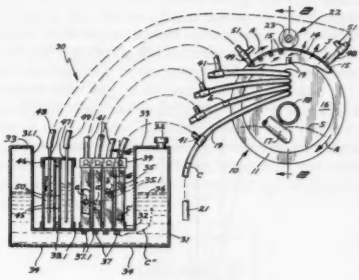
Filed Mar. 19, 1973, Ser. No. 342,611
Int. Cl. G07f *11/00*
U.S. Cl. 221—2 **12 Claims**

1. In combination with a seed dispenser including a revolving drum containing superatmospheric air and a supply of seeds and the receiving ends of stationary discharge tubes located out of the seed supply and in confronting relation to peripheral apertures in which the seeds are carried until released at the discharge tubes through which the superatmospheric air sweeps the seeds for discharge from the drum,

an air flow a combined, continuously acting obstruction detector and indicator for such discharge tubes comprising a reservoir of liquid,

a sight glass with its lower end in liquid flow communication with the reservoir of liquid to equalize the liquid level in the glass and reservoir, the sight glass having a closed top, and

a pressure transfer tube communicating with the sight glass through the closed top thereof, and the transfer tube also



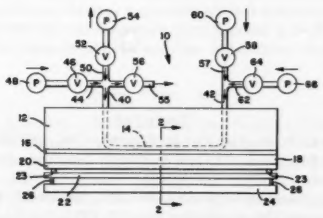
being connected to one of the seed discharge tubes in air pressure communicating relation to apply the air pressure from the discharge tube with the sight glass for application against the liquid therein and produce a liquid level which will subsequently change in response to pressure changes in the discharge tube caused by obstructed air flow therethrough.

3,891,121

METHOD OF OPERATING A DROP GENERATOR THAT INCLUDES THE STEP OF PRE-PRESSURIZING THE LIQUID MANIFOLD

Leonard G. Stoneburner, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 4, 1972, Ser. No. 277,998
Int. Cl. B87b *7/00*
U.S. Cl. 222—1 **10 Claims**



1. A method of commencing operation of a drop generator which includes orifice defining means and a manifold communicating with said orifice defining means for providing a supply of liquid coating material thereto comprising:

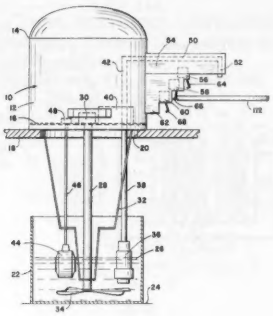
a. pressurizing said manifold with a gas to a pressure above the coating pressure necessary to cause said coating material to be ejected from said orifice defining means as a free standing filament which forms a series of discrete drops, and

b. thereafter introducing said coating material into said manifold at a pressure no less than said coating pressure.

3,891,122
AUTOMATIC FLUID DISPENSING APPARATUS

Archie V. Paranto, Dallas, Tex., assignor to Barco International Corporation of Texas, Dallas, Tex.

Filed Dec. 2, 1969, Ser. No. 881,521
Int. Cl. B67d *5/30*
U.S. Cl. 222—17 **6 Claims**



1. An automatic fluid dispensing apparatus comprising a housing disposed in substantial alignment with a stationary fluid reservoir, a rotatable shaft carried by the housing and extending into the fluid reservoir, power means provided in the housing and operably connected with the shaft for continuous rotation thereof during operation of the apparatus, an impeller provided on the outer end of the rotatable shaft and disposed in the proximity of the bottom of the fluid reservoir for agitating the fluid therein to maintain a substantially homogeneous solution, pump means disposed within the fluid reservoir and open to the fluid therein, power means provided in the housing and operably connected with the pump for selective intermittent actuation thereof, discharge conduit means connected with the pump for delivery of the fluid from the reservoir for dispensing thereof, control means operably connected with the pump power means for intermittent operation thereof in predetermined time cycles for the dispensing of predetermined quantities of the fluid from the discharge conduit means, selective switching means carried by the housing and operably connected with the control means for selectively timed operation thereof whereby a variable preselected quantity of fluid is automatically dispensed through the discharge conduit in accordance with the desired quantity of fluid required.

3,891,123
AUTOMATIC FLUID DISPENSING SYSTEM

Donald Blackburn, 21 Gale Ave., Apt. 436, Toronto, Ontario, Canada

Continuation of Ser. No. 237,373, March 23, 1972, abandoned. This application Nov. 27, 1973, Ser. No. 419,476
Int. Cl. B67d *5/14*
U.S. Cl. 222—64 **10 Claims**

1. A system for supplying metered quantities of a liquid to a plurality of receiving stations including:

a source of liquid including a holding reservoir;

a head tank, said head tank having an inlet connected to said holding reservoir;

inlet control means for maintaining a predetermined level of liquid in said head tank;

means to insure that said head tank fills only to the predetermined level when the liquid is supplied to said head tank irrespective of the head pressure of the liquid in said holding reservoir;

said insuring means including:

pump means to transfer liquid from said holding reservoir to said head tank;

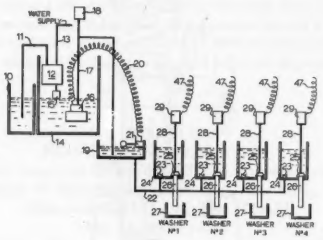
and means to prevent siphoning of liquid from said holding reservoir to said head tank when said pump means is inactive;

said inlet control means including means to terminate said pump means when the level in said head tank reaches the predetermined level;

a plurality of dispensing tanks;

means connecting each of said dispensing tanks to said head tank to cause the liquid in each of said dispensing tanks to be at the same level as the level of said head tank, each of said dispensing tanks having a predetermined volume of liquid therein in accordance with the size of said dispensing tank and the level of liquid therein;

separate check valve means cooperating with each of said dispensing tanks to prevent back flow of the liquid from any of said dispensing tanks while allowing said head tank



to communicate therewith through said connecting means;

individual conduit means connecting each of said dispensing tanks with one of the receiving stations to allow gravity flow of the liquid from said dispensing tank to the receiving station;

separate means to control the flow of liquid through each of said individual conduit means to each of the receiving stations;

and means to activate each of said separate control means when the liquid is to be supplied to the receiving station to which said separate control means controls flow of the liquid, said activating means activating each of said separate control means for a sufficient period of time to allow the predetermined volume of liquid within said dispensing tank to flow by gravity through said individual conduit means to the receiving station to which said separate control means controls flow of the liquid from said dispensing tank.

3,891,124
MEANS FOR STORING AND DISPENSING HEATED LIQUID WITH EXPANSION CHAMBER MODULE AND SYSTEM THEREFOR

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to Emerson Electric Co., Cedar Grove, N.J.

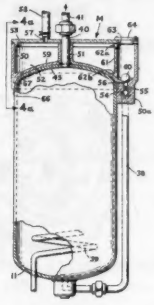
Filed Aug. 16, 1974, Ser. No. 498,073
Int. Cl. B67d *5/62*; **F24h** *1/20*
U.S. Cl. 222—66 **19 Claims**

1. An expansion module made for use in a liquid heating and dispensing system operating at atmospheric pressure comprising:

a. means forming an expansion chamber for accumulating expansion and backflow liquid from the heating and dispensing system,

b. a combined overflow and vent means on said expansion module communicating at one end with said expansion chamber and at the end remote therefrom open to atmosphere,

c. outlet port means disposed at the lower section of the expansion module communicating at one end with the expansion chamber,
d. aspirator means on said expansion module communicating with the other end of said port means, and having an inlet, and an outlet,
e. said aspirator means having said inlet and outlet operatively connected to the heating and dispensing system



whereby on dispensing of heated liquid from the system the aspirator means will withdraw collected expansion and backflow liquid from the expansion chamber, and
f. outflow cut-off means responsive to the level of collected liquid in the expansion chamber operative to close the outlet port means when the level of the liquid in the expansion chamber drops to a predetermined minimum level.

3,891,125

DEVICE FOR STORING TWO PRODUCTS SEPARATELY AND SUBSEQUENTLY MIXING THEM

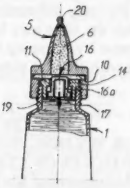
Bruno Morane, and Jean Louis Guerét, both of Paris, France, assignors to Societe Anonyne dite: L'Oreal, Paris, France

Filed Dec. 20, 1973, Ser. No. 426,689

Claims priority, application France, Dec. 28, 1972, 72.46588

Int. Cl. B65d *1/04*

U.S. Cl. 222—129 **11 Claims**



1. Device for storing and dispensing a misture of a first product and at least one additional product, said device comprising:
a container for holding said first product, said container being provided with a neck,
a hollow spout-shaped dispensing cap defining a recess for holding said at least one additional product, said cap being provided at one end with a skirt adapted to fit onto the outside of said neck, with an annular surface between said skirt and the edge of said recess, and with integral means at its other end adapted to create a dispensing orifice when removed from said cap,
a capsule which acts as a closure for said recess when said capsule is located therein, said capsule having a first end which is a force fit in said recess and a second end provided with a supporting flange which projects radially outward therefrom,
a cup having sides adapted to be received in said neck and a bottom defining an opening through which said first end of said capsule projects into said recess, so that the bottom of said cup is gripped between the supporting flange on said capsule and the annular surface on said cap,
the outer diameter of said capsule being less than that of the opening in the bottom of said cup so that said capsule is slidable with respect to said opening and the outer diameter of said supporting flange being greater than the diameter of the opening in the bottom of the cup but less than the inner diameter of the sides of the cup, and
means for frictionally retaining the sides of said cup in the neck of said container, whereby when said cap is moved away from said container along said neck said capsule is prevented by said flanges from being removed with said cap, but is instead separated from said cap so as to be free to fall into said container.

3,891,126

INJECTION CYLINDERS OF DIE CAST MACHINES

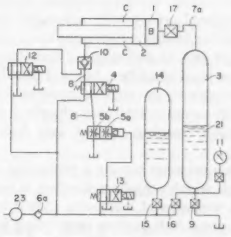
Kazuyoshi Segawa, Tokyo, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,548

Claims priority, application Japan, Nov. 14, 1972, 47-114482

Int. Cl. B22d *17/04*

U.S. Cl. 222—334 **6 Claims**

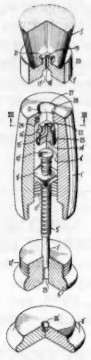


1. In an injection cylinder of a die cast machine of the class wherein the piston of the cylinder is moved in forward and rearward directions by admitting and discharging pressurized fluid into and out of said cylinder, the improvement which comprises a gas accumulator containing pressurized gas and a predetermined quantity of liquid, said predetermined quantity of liquid being used for adjusting the pressure of the gas contained in said accumulator, said gas accumulator having substantially larger volume than said cylinder, a flow control valve connected between said cylinder and said gas accumulator for admitting said gas into said cylinder thereby moving said piston in the forward direction by the expansion of said pressurized gas for performing die casting, a source of pressurized liquid, means operatively coupled for admitting said pressurized liquid into said cylinder on the opposite side of said piston to move the same in the rearward direction thereby compressing the gas in said gas accumulator, and means operatively coupled for controlling the flow rate of said pressurized liquid while the liquid is discharged from said cylinder when said piston is moved in the forward direction.

3,891,127
MATERIAL APPLYING DISPENSER HAVING SCREW ACTUATED FEED

Alberto Fernandez, and Eduardo Quintero, both of Carrera 5 No. 15-11, Bogota, Colombia

Filed Dec. 4, 1973, Ser. No. 421,725
Int. Cl. B67d *5/42*
U.S. Cl. 222—387 1 Claim



1. The construction of a device for dispensing and applying paste material, comprising:

a. a handle portion having a hollow chamber polygonal in cross-sectional area axially arranged along said handle, said chamber having a narrower axial cylindrical opening in its front end so defining a circumferential shouldered portion on said chamber, being it provided through said shoulder portion an angular passage with a leg thereof rearwardly opening into said chamber and with its other leg laterally opening toward said narrower cylindrical opening;

b. a coupling member having a polygonal hub portion at its front end, which coupling member is lodged and rotably retained within said narrower cylindrical opening with said polygonal hub portion protruding from the front end surface of said handle portion, an angular passage being provided through said coupling member, with said angular passage being formed with an axially directed leg and the other leg thereof laterally opens at the same plane as does it the laterally opening leg of said passage provided through said shouldered portion;

c. a head portion for applying paste material having an axially arranged passage therethrough, the underside of which head portion is provided with a polygonal recess into which is push fitted said polygonal hub in said coupler member for rotably coupling said head portion on the front surface of said handle portion;

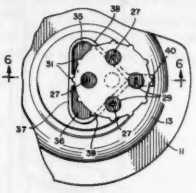
d. a worm screw axially housed within said polygonal cross-sectional chamber, the rear end portion of said worm screw being rotably supported through a central opening in said cap member and with its exposed end being provided with an engaged element preventing the backward sliding of said worm screw and which allows the rotation thereof; and

e. a plunger member, having correspondingly polygonal perimeter, being centrally and threadably mounted on said worm screw for travelling therealong in running fit along the inner side walls of said chamber, with the forward stroke of said plunger member being limited by a stop means fixedly provided on the front end of said screw.

3,891,128
ACTUATOR FOR AEROSOL CAN VALVE

Thomas J. Smrt, 31 W. 300 W. Bartlett Rd., Bartlett, Ill. 60103

Continuation-in-part of Ser. No. 193,433, Oct. 28, 1971, Pat. No. 3,817,429, which is a continuation-in-part of Ser. No. 152,903, June 14, 1971, abandoned, which is a continuation-n-part of Ser. No. 118,351, Feb. 24, 1971, Pat. No. 3,700,144. This application Aug. 29, 1973, Ser. No. 392,618. The portion of the term of this patent subsequent to June 18, 1991 has been disclaimed.
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.17 3 Claims



1. An actuator for an aerosol can valve comprising a base portion and an orifice portion, the base portion having a pair of ends and a bore extending therethrough from one end to the other, the orifice portion having a plurality of rectangular spraying orifices of various sizes and being rotatably mounted on one end of the base portion for rotation about an axis extending parallel to the bore at said one end, the spacing between the spraying orifices and the axis of rotation being substantially the same as the spacing between the bore at said one end and the axis of rotation whereby the spraying orifices can be selectively aligned with the bore at said one end, the base portion haivng a flat aligning side surface adapted to be engaged with aligning means of a spray apparatus for rotating the actuator on the aerosol can valve when the flat aligning side surface of the base portion is engaged with the aligning means of the spray apparatus, each of the rectangular spraying orifices having a long dimension extending tangentially to an arc drawn with respect to the axis of rotation of the orifice portion, the flat side surface of the base portion extending parallel to the long dimension of the spraying slot which is aligned with the bore and parallel to the axis of the bore at said one end whereby the long dimension of the spraying orifice which is aligned with the bore may be aligned with respect to the spraying apparatus by engaging the aligning means of the spraying apparatus with the flat side surface of the base portion.

3,891,129
PROCESS FOR FOLDING SHIRTS OR SIMILAR ARTICLES OF CLOTHING

Heinrich Knappe, Eidinghausen; Karl Heinz Notle, Vlotho, and Reinhold Kempelmann, Bad Salzuflen, all of Germany, assignors to Herbert Kannegiesser Kommanditgesellschaft, Vlotho/Weser, Germany

Filed Nov. 5, 1974, Ser. No. 521,120
Claims priority, application Germany, Nov. 10, 1973, 2356262
Int. Cl. A41h *33/00*
U.S. Cl. 223—37 1 Claim

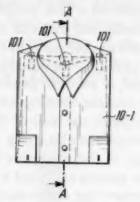
1. A process for folding shirts or similar articles of clothing for packing wherein the shirt is placed front down on a table, comprising the steps of:

a. placing a rigid insert on the back of the shirt adjacent the neck portion of the shirt, said insert having at least one opening therethrough;

b. folding said shirt longitudinally about said insert such that the shoulder portions of said shirt are adjacent to the opening through said insert;

c. inserting a first clip through said opening in said insert and over said shoulder portions so as to retain said shoulder portions in position with respect to said insert;

d. folding said shirt transversely such that a lower portion of said shirt overlies said shoulder portions; and



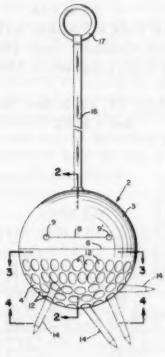
e. inserting at least a second clip over said lower portion and said shoulder portions of said shirt to retain the lower portion in its folded position.

3,891,130

GOLF TEE CARRYING AND DISPENSING DEVICE

Edward N. Brennan, 1490 Windsor Dr., Thousand Oaks, Calif. 91360

Filed Aug. 2, 1973, Ser. No. 384,983
Int. Cl. A45c *1/04*
U.S. Cl. 224—5 C **4 Claims**



3. A golf tee carrier and dispensing device comprising:

a. a body fabricated in spherical form from a deformable plastic material and having a hollow interior defined by a resiliently deformable wall;

b. means formed in said wall adapted to selectively provide an opening into the interior of said hollow body;

c. a multiplicity of apertures formed in said wall through each of which the shank of a golf tee may freely project; and

d. means secured to said hollow body for suspending the carrier and dispensing device.

3,891,131

DIVER'S HARNESS FOR COMPRESSED AIR TANK

Kazuo Tabata, 1-3-17, Higashi, Komagata, Sumida-Ku, Tokyo, Japan

Filed Apr. 24, 1973, Ser. No. 353,935
Int. Cl. A45f *3/10*; **B63c** *11/02*
U.S. Cl. 224—25 A **1 Claim**

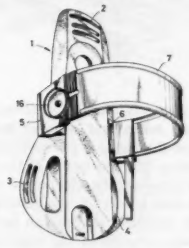
1. A diver's harness comprising in combination:

a substantially flat elongated vertically-oriented body having upper and lower portions, said upper and lower portions having a series of elongated holes therein which are adapted to receive a support-type belt member;

first and second connecting members, each of said first and second connecting members having a shape of the letter L and the horizontal part of each of the letters L-shaped connecting members being fixedly secured at approximately the medial point of said elongated body and the vertical part of each of the letters L-shaped connecting members being outwardly extended from said elongated body;

a C-shaped clamping member, one of the terminal ends of which being fixedly attached to said first L-shaped connecting member;

slot and bolt means adjustably connecting the other said terminal end of said C-shaped clamping member to said second L-shaped connecting member whereby compressed air tanks of various sizes may be selectively accomodated within the enclosure formed by the C-shaped



clamping member and the median section of the elongated body;

said first L-shaped connecting member being provided with a supporting element; and

a lever means mounted on said supporting element and pivoting about a fixed point adjacent to said first L-shaped connecting member to selectively assist in attaining locked and unlocked conditions between said C-shaped clamping member and said elongated body, said C-shaped clamping member including a bent portion positioned between said lever means and the horizontal parts of said first L-shaped connecting member, said lever means having a circular arc portion on one end and a handle portion on the other end, said circular arc portion having a groove on the periphery thereof, said peripheral groove making a sliding contact with said supporting element and circular arc portion making camming contact with said bent portion to attain said locked condition.

3,891,132

APPARATUS FOR TRANSPORTING A BICYCLE ON A VEHICLE

Roy L. Chandler, Arlington, Tex., assignor to Red Ant Products, Inc., Mansfield, Tex.

Filed Jan. 29, 1973, Ser. No. 327,426
Int. Cl. B60r *9/10*
U.S. Cl. 224—42.03 B **6 Claims**

1. A bicycle carrier for transporting a bicycle at one end of a vehicle such as an automobile or truck or the like, comprising:

a. a bracket adapted to be mounted on a bumper at one end of the vehicle and to transfer generally vertical loads to the frame of the vehicle;

b. structural means including an elongated cantilevered rail for supporting the weight of the bicycle at least partially through the bicycle's wheels when the bicycle is in a normally erect position;

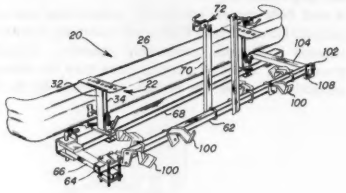
c. structural means for pivotally connecting the proximate end of the rail to the bracket, with the pivot axis being

generally vertical such that the rail may be selectively swung outwardly away from the vehicle;

d. an upright post for rigid attachment to the rail at a selected position near the center of the rail;

e. a frame clamp;

f. means for mounting the frame clamp near the top of the upright post, including means for adjustably locating the clamp adjacent some portion of the bicycle frame when the bicycle is supported in an erect position over the rail, whereby at least part of the weight of the bicycle is adapted to be transferred from the wheels to the rail and



the frame clamp is adapted to maintain the bicycle erect;

g. generally horizontal support means adapted to be mounted on the bumper for supporting the distal end of the rail during transportation of the bicycle; and

h. means for adjusting the inclination of the axis of rotation of the rail with respect to the vehicle, whereby the distal end of the cantilevered rail can be selectively raised or lowered with respect to the support means to effect a desired distribution of the weight which is being transferred from the rail to respective portions of the bumper during transportation of the bicycle.

3,891,133

FASTENING ELEMENT FEED MECHANISM FOR AN EXPLOSION CHARGE-DRIVEN SETTING GUN

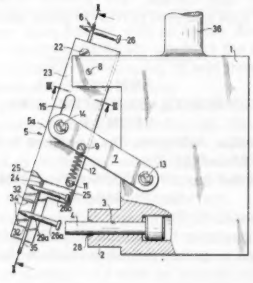
Elmar Maier, Feldkirch-Tsis, Austria; Robert Tilg, and Karl Walser, both of Schaan, Liechtenstein, assignors to Hilti Aktiengesellschaft, Liechtenstein

Filed July 30, 1973, Ser. No. 384,098

Claims priority, application Germany, Aug. 2, 1972, 2238105

Int. Cl. B25c *1/14*

U.S. Cl. 227—10 **14 Claims**



1. Explosive charge-driven setting gun for inserting fastening elements, such as bolts, nails and the like into a receiving material, preferably a hard material, including a gun body having a muzzle opening, driving means mounted within said gun body and displaceable through said muzzle opening from a driving position rearwardly of said muzzle opening for inserting fastening elements one at a time into the receiving material, a feed mechanism arranged for feeding a magazine containing spaced fastening elements so that the fastening elements are successively positioned in alignment with and within the muzzle opening in said gun body for insertion into the receiving material, wherein the improvement comprises means for pivotally connecting said feed mechanism to said gun body for pivotally displacing said feed mechanism relative to said gun body between a first position in which a fastening element is aligned with and extends into the muzzle opening and displaces said driving means into the driving position with the magazine extending perpendicularly to the axis of the muzzle opening and a second position pivotally displaced outwardly from the muzzle opening with the magazine extending at an oblique angle to the axis of the muzzle opening, said feed mechanism comprises a housing forming a guideway for directing the passage of the magazine therethrough, said feed mechanism includes means actuated by the pivotal movement of said feed mechanism for controlling the movement of the magazine and disposing the fastening elements through the feed mechanism into position for alignment with said muzzle opening so that one fastening element can be positioned within the muzzle opening, said means for controlling the movement of the magazine comprises a control element mounted in said housing and displaceably positionable within said guideway, said housing has an opening alignable with the muzzle opening in said gun body when said feed mechanism is in the first position so that a fastening element positioned within the muzzle opening and any parts of the magazine associated with the fastening element located within the muzzle opening can be displaced from said feed mechanism during the insertion operation.

3,891,134

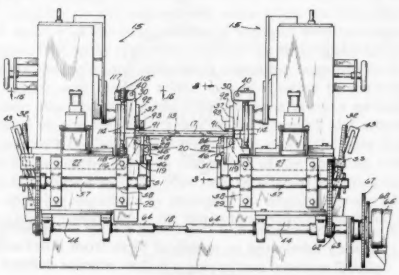
FURNITURE PIECE FABRICATING MACHINE

Henry W. Kratsch, Oshkosh, and Theodore W. Doehling, Larsen, both of Wis., assignors to Medslist Industries, Inc., Milwaukee, Wis.

Filed Nov. 21, 1973, Ser. No. 417,874

Int. Cl. B27f *4/00*

U.S. Cl. 227—14 **12 Claims**



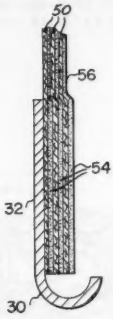
1. In a furniture piece fabricating machine for setting a dowel in a workpiece to project substantially at a right angle from a cut surface thereof, said machine having a workpiece holder, a cutoff saw to cut said surface, a tool bed adjacent the workpiece and tilting mechanism by which the bed can be tilted to vary the path of approach of a tool on said bed to the workpiece, the improvement in said machine by which the approach path of the tool to the workpiece will intersect the cut face of the workpiece at substantially a right angle in any of a variety of tilt angles of said bed without requiring adjustment of the workpiece or tool after change in tilt angle, said improvement comprising both said cutoff saw and said tool being mounted on said bed to partake of tilt motion thereof, bed pivot means which defines a bed tilt axis disposed substantially in the plane of said saw whereby the said axis will also be disposed substantially in the plane of the cut surface of the workpiece, said tool having a path of approach to the workpiece substantially at a right angle to the plane of said saw

whereby siad path will also be disposed substantially at a right angle to the cut surface of the workpiece.

3,891,135
CONVOLUTE WOUND FIBRE DRUM WITH THERMOPLASTIC ADHESIVE

Richard R. Szatkowski, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,561
Int. Cl.[2] B65D *3/04, 3/22*
U.S. Cl. 229—4.5 **5 Claims**

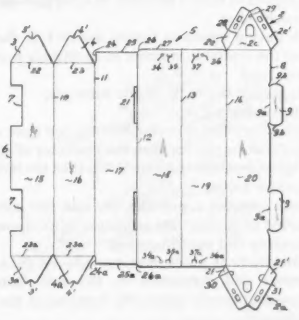


1. In a fibre drum container having a tubular body member and a closure attached to at least one end by deformation of the tubular body member, the improvement comprising:
   a. several plies of convolutely wound paperboard; and
   b. a layer of thermoplastic adhering the plies of paperboard to one another, means for permitting deformation of the body member adjacent said one end without rupture of the paperboard, said means including said thermoplastic adjacent the deformed end having a greater elasticity than the remaining thermoplastic.

3,891,136
CONTAINER FOR ROLLED WEBS OF GOODS

Dieter Woeste, Kestnerstrasse 42, 3 Hannover, Germany

Filed Jan. 23, 1974, Ser. No. 435,839
Claims priority, application Germany, Jan. 24, 1973, 2303240
Int. Cl. B65d *5/00*
U.S. Cl. 229—22 **10 Claims**

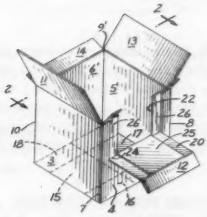


1. A tubular container for receiving and storing rolled-up paper webs, drawings, and similar material, which includes a one-piece web having parallel free end edges and being folded along substantially parallel folding lines into a rigid tubular container having an outer polygonal cross-sectional contour, said folding lines extending in the longitudinal direction of said tubular container and defining substantially parallel inner and outer wall strips therebetween while those ones of said folding lines which are closest to said free end edges define therewith end strips, one of said end strips having its free end edge provided with cut-out means and forming an inner wall of said container, and the other one of said end strips having its free end edge provided with tongue means, that one of said folding lines of said tubular container which is closest to said free end edge with said tongue means being provided with slot means aligned with said tongue means, said tongue means extending through said slot means and being located within said cut-out means.

3,891,137
CORRUGATED CONTAINER HAVING ACCESS DOOR

Donald E. Ellison, Clayton, and Larry C. Davenport, Indianapolis, both of Ind., assignors to Inland Container Corporation, Indianapolis, Ind.

Filed May 11, 1973, Ser. No. 359,345
Int. Cl. B65d *5/66*
U.S. Cl. 229—44 R **5 Claims**



1. A fiberboard container of generally rectangular parallelepiped shape comprising a unitary outer blank of corrugated fiberboard and a separate and distinct inner liner of corrugated fiberboard which is laminated to at least a major portion of the inner vertical surface area thereof, vertical score means dividing said outer blank into four sidewall panels, said inner liner having a vertical height substantially equal to that of said sidewall panels and being laminated to all four sidewall panels at locations flanking said vertical score means to contribute substantially to the stacking strength of the container, means in at least one of said sidewall panels defining a generally rectangular access door therein located with a first horizontal edge of said access door being colinear with the upper edge of said panel and with a second edge of said door being the horizontal line along which said door is hinged to the remainder of said outer blank, and an access opening being provided in said inner liner of narrower horizontal dimensions than the horizontal dimensions of said access door so that a positive stop is provided by said inner liner at both vertical edges of said access door.

3,891,138
MULTI-COMPARTMENT PACKAGE FOR REACTIVE COMPOSITIONS

Willi Glas, Renningen, Germany, assignor to Fr. Hesser Maschinenfabrik AG, Stuttgart-Bad Cannstatt, Germany

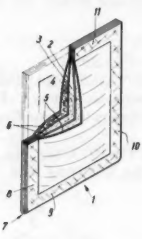
Filed Mar. 12, 1973, Ser. No. 340,471
Claims priority, application Germany, Mar. 16, 1972, 7209949[U]
Int. Cl. B65d *31/12, 73/00, 77/00*
U.S. Cl. 229—56 **4 Claims**

1. A package for reactive multi-component compositions having a multi-layer sandwich-like construction composed of a first heat seal responsive packaging material initially folded lengthwise substantially in V-shape form, a second heat seal responsive material constituting a dividing wall also initially folded lengthwise in substantially V-shape form and disposed in substantially parallel relationship within the opening of the first packaging material;

a continuous first seal extending all along the fold line to bond or adhere together the adjacent surfaces at said fold line of the first and second flexible material;

a continuous second and third seal extending substantially at right angle to the first seal and axially spaced relative to each other joining at one end said first seal;

and a continuous fourth seal extending substantially vertically spaced parallel to said first seal and between and connecting to said second and third seal, all of said seals

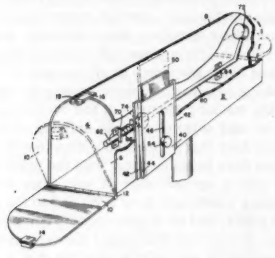


being of substantially identical construction and located as a margin along the periphery of the package; each of the packaging material surfaces facing each other establishing, except for the seal areas, a non-adhesive relationship to provide three separate and sealed compartments each for containing a dissimilar reacting material.

3,891,139
MAILBOX APPARATUS

Anthony E. Redling, 1727 Kalakava Ave., Apt. A-4, Honolulu, Hawaii 96814

Filed Jan. 30, 1974, Ser. No. 437,806
Int. Cl.[2] B65B *91/00*
U.S. Cl. 232—35 **10 Claims**

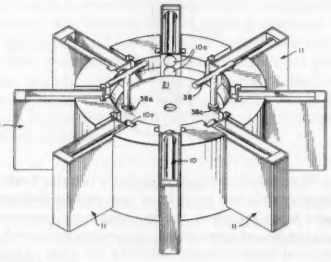


1. Mailbox apparatus having an elongated enclosure formed by a base and a mounting means connected to the base, parallel side walls extending upward from the base, a top connecting the parallel side walls, an imperforate rear wall rearwardly connected to the base, the parallel side walls and the top, a door mounting means connected to the mailbox apparatus and a door connected to the door mounting means for selectively opening and closing the mailbox, an indicator mounting means connected externally to the mailbox, and a indicator connected to the indicator mounting means for moving between positions indicative of state of contents of the mailbox apparatus, wherein the improvement comprises actuator means mounted for movement in the mailbox apparatus, directional means connected to the actuator means for urging the actuator means in a single direction, stop means connected to the actuator means for limiting permissive movement of the actuator means, magnet means connected to the actuator means and positioned in the mailbox apparatus for movements between a first position opposite the indicator means, and a second position remote from the indicator means, for holding the indicator means when the magnet means is in the first position and for releasing the indicator means when the magnet means is in the second position, wherein the indicator means is constructed of a magnetic material and wherein a remainder of the mailbox apparatus is constructed of a non-magnetic opaque material.

3,891,140
CENTRIFUGE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,369
Int. Cl.[2] B04B *5/00*
U.S. Cl. 233—26 **7 Claims**

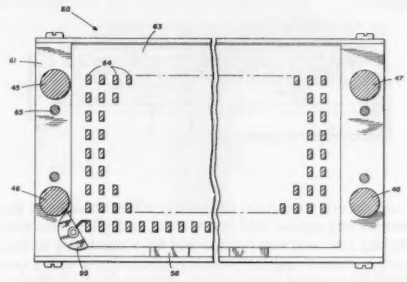


1. A centrifuge for liquid separator tubes comprising:
drive means,
a rotatable member mounted on the drive means,
said rotatable member having an even numbered plurality of uniformly spaced supports around the periphery of the rotatable member with opposite supports equidistant from the axis of the drive means,
a rack adapted to hold a plurality of separator tubes spaced from each other,
said rack having means to mount the rack in the said supports of the rotatable member in an attitude normal to the said axis, and
means to secure the racks in the supports,
said rack comprising:
a. a pair of vertical side members spaced from each other by a distance greater than the diameter of said separator tubes and having a height less than the height of said separator tubes;
b. a base member connecting the said side members and adapted to support the separator tubes during loading, unloading and centrifugation;
c. a longitudinal guide member spaced from the base member and supported by the side members and adapted to evenly space the bottoms of the separator tubes; and
d. a top rack member having a series of holes larger than the separator tubes and adapted to space said tubes;
e. said top rack member being secured to bent over edge portions of said vertical side members to form a pair of flanges adapted to fit into cooperating slots in the said supports of the rotatable member and retain the rack in the rotatable member.

3,891,141
METHOD OF SEVERING CORNERS AND PUNCHING CARDS

Cothburn M. O'Neal, Dallas, and Alfred M. Mayo, Richardson, both of Tex., assignors to Riverside Press, Inc., Dallas, Tex.

Division of Ser. No. 309,192, Nov. 24, 1972. This application July 31, 1974, Ser. No. 493,214
Int. Cl. G06k *1/02*
U.S. Cl. 234—1 **4 Claims**

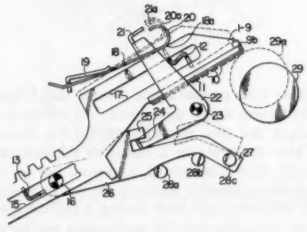


1. The method of marking a data processing card in a machine having marking means associated therewith, said method comprising:
   inserting the card into said marking means,
   marking said card in a predetermined pattern to record the selected information thereon,
   simultaneously marking the card with a coded pattern identifying the machine performing the marking operation,
   severing a corner during the marking operation thereby establishing the proper orientation of said card for subsequent processing.

3,891,142
DEVICE FOR CALCULATING MACHINES WHEREIN THE PLATEN IS TAPPED AGAINST THE TYPES, TO ALLOW FOR AN UNIFORM IMPRESSION THEREOF

Gian Piero Barozzi, and Giancarlo Horeschi, both of Crema, Italy, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,473
Claims priority, application Italy, Dec. 29, 1972, 33842/72
Int. Cl. G06c *11/04*
U.S. Cl. 235—58 P **5 Claims**

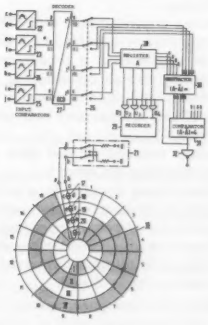


1. A recording device for a calculating machine or the like in which a paper supporting platen is tapped against types, comprising:-
   a. a platen for supporting paper;
   b. a plurality of type carriers each mounted to be movable stepwise in relation to the platen to set individual ciphers carried by the type carriers in an impressing position relative to the platen, each type carrier being displaceable in a plane perpendicular to the axis of the platen;
   c. a plurality of resilient members associated respectively with the type carriers and urging the type carriers towards the platen, the resilient members each having a first operative condition in which the force urging the type carrier associated therewith towards the platen is greater than when the resilient member is in a second operative condition thereof;
   d. means operative when the resilient members are all in their second operative condition to suppress each cipher to the left of the leftmost significant cipher by displacing the type carriers carrying those ciphers away from the platen against the force of the resilient members associated with those type carriers; and
   e. a rigid member movable to a position in which it engages those resilient members which are associated with type carriers carrying the leftmost significant cipher and ciphers to the right thereof to place those resilient members in their first operative condition while leaving the resilient members associated with the type carriers carrying suppressed ciphers in their second operative condition.

3,891,143
ENCODING APPARATUS HAVING AN IMPROVED CODE PERMITTING ERROR READING AND ERROR DETECTION

Jochen Haeusler, Nurnberg-Laufamholz, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1973, Ser. No. 421,683
Claims priority, application Germany, Dec. 27, 1972, 2263619
Int. Cl. G06k *5/00;* **G06f** *11/08;* **G08c** *9/04*
U.S. Cl. 235—61.7 R **4 Claims**



1. Improved encoding apparatus which provides for error free reading and error detecting comprising:
   a. an index carrier having a plurality of coded tracks thereon;
   b. a plurality of pick-up elements arranged in a row adjacent said tracks;
   c. means for storing a representation of the reading detected by said pick up elements;
   d. means for obtaining the inverse of said reading;
   e. means for determining the absolute value of the difference between said reading and said inverse;
   f. means for comparing said absolute value with a constant value equal to the number of said plurality of tracks and to provide an output indicating whether or not said absolute value is equal to said constant value; and

g. the code on said index carrier being such that for each position the absolute value of the difference between the number represented by a direct reading of said code and its inverse is equal to said constant.

3,891,144

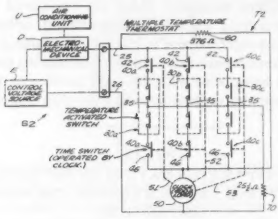
CLOCK CONTROLLED THERMOSTAT

Keith A. Sadler, 1505 Del Gado Dr., Sherman Oaks, Calif. 91403, and Ralph E. Phillips, Jr., 9154 Janice Pl., Beverly Hills, Calif. 90210

Division of Ser. No. 366,584, June 4, 1973, Pat. No. 3,825,872. This application Mar. 14, 1974, Ser. No. 451,006

Int. Cl. G05d *23/32*

U.S. Cl. 236—46 **4 Claims**



1. An air conditioning system comprising:

an air conditioning unit;

a control voltage source;

an electromechanical device coupled to said air conditioning unit for selectively turning the same on or off, and having a pair of electrical connections; and

a temperature control device having a pair of electrical terminals coupled in a series loop with said voltage source and with said electrical connections of said electromechanical device;

said temperature control device including

a. multiple temperature-activated switches each of which is operable in response to a predetermined temperature level for turning said air conditioning unit on or off,

b. multiple time switch means operable for coupling a selected one of said temperature-activated switches across said terminals,

c. timing means coupled to said time switch means for selectively operating the same,

d. first resistor means coupled in a series loop with said timing means and said terminals when the selected temperature-activated switch is open, and

e. second resistor means coupled in parallel with said timing means between said terminals when the selected temperature-activated switch is closed.

3,891,145

HYDRAULIC TRACKING VALVE FOR TEMPLATES IN MACHINE TOOLS OR THE LIKE

Reiner Bartholomäus; Hubert Bernd, and Friedel Liedhegener, all of Lohr/Main, Germany, assignors to G. L. Rexroth GmbH, Lohr/Main, Germany

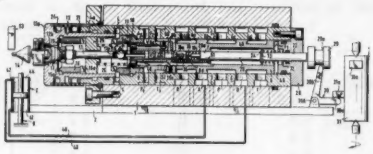
Filed July 26, 1973, Ser. No. 382,711

Claims priority, application Germany, July 27, 1972, 2236919

Int. Cl. F15b *13/042;* **B23q** *35/18*

U.S. Cl. 137—625.6 **2 Claims**

1. In a hydraulic tracking valve which controls the flow of a hydraulic fluid to and from a hydraulic motor, especially a motor which effects the movement of a tool-supporting carriage as a function of changes in the outline of a template, a combination comprising a housing; a main valve member reciprocably mounted in said housing and having a relatively large first radial surface and a relatively small second radial surface, said surfaces facing in opposite directions so that bodies of a pressurized fluid acting on said surfaces tend to move said main valve member in opposite directions and said second surface being under constant fluid pressure, said main valve member being further provided with an axial bore; a follower arranged to track the outline of a template; an axially movable pilot valve mounted in said axial bore of said main valve member and comprising a first end portion mechanically connected with said follower so as to be movable axially in



first and second directions to thereby effect changes in fluid pressure acting against said first surface, said pilot valve member having a second end portion and fluid-regulating surfaces flanking a control chamber which communicates with a compartment provided in said housing adjacent to said first surface; adjustable resetting means for said pilot valve member coupled to said second end portion of the latter, said resetting means extending from said housing; and activating means for moving said pilot valve member by way of said resetting means.

3,891,146

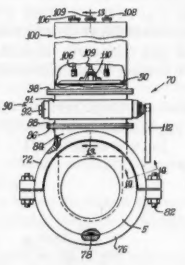
PIPELINE APPARATUS

George A. Blazek, Hinsdale, Ill., assignor to Advance Value Installations Inc., Hinsdale, Ill.

Filed Sept. 12, 1973, Ser. No. 396,510

Int. Cl. F16l *29/00*

U.S. Cl. 138—94.3 **12 Claims**



1. A fitting for a pressure pipe system, said fitting comprising a body having a flow passageway extending therethrough and having a slot thru the wall thereof for movement of a member into the body in a direction substantially at right angles to the flow passageway, a closure bar for closing the slot, means for releasably securing the bar in position closing the slot in the body, said body having a surface constituting a seat for an operating unit for performing mechanical operations within the fitting by access thereunto through the slot, said surface surrounding the slot and the closure bar and the bar securing means so that when the unit is on said surface and secured to the fitting the bar securing means may be released and together with the bar retracted from the slot while maintaining the fitting under pressure in the pipe system, to permit insertion or removal of such member by a movement thru the slot into or out of the body while the body is under pressure.

3,891,147
PROCESS FOR STORING A LIQUID FOR ITS DISTRIBUTION IN THE GASEOUS STATE

Jean Jacques Kleine, Letraz-Sevrier, France, assignor to S.T. Dupont, Paris, France

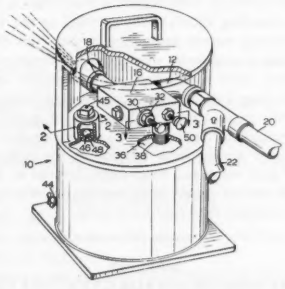
Division of Ser. No. 288,396, Sept. 12, 1972, Pat. No. 3,813,041. This application Jan. 10, 1974, Ser. No. 432,329
Claims priority, application France, Sept. 13, 1971, 71.32946; June 6, 1972, 72.20346
Int. Cl.[2] A61L 9/04
U.S. Cl. 239—6 8 Claims

1. A process for storing, in the liquid state, a liquefiable product with a view to its distribution in the gaseous state, into an atmosphere whose pressure is less than the storage pressure, said process comprising disposing in the storage enclosure, in conjunction with the liquid product to be distributed, a solid polymer with respect to which the liquid acts as a swelling solvent; said polymer being absorbative of the liquefied gas and having a limited solubility parameter with respect to said liquefied gas so as to undergo swelling and form a gel which releases the liquid only in gaseous state, said solubility parameter of the polymer differing at most from the liquified gas by ±2.0.

3,891,148
SPRAY DEVICE

Gilles Rousseau, North Bay, Canada, assignor to Patrick Harrison & Company Limited, Toronto, Canada

Filed Feb. 11, 1974, Ser. No. 441,360
Int. Cl. A01g 27/00
U.S. Cl. 239—68 7 Claims



1. A device for spraying water with an automatic shut off comprising a body,

a nozzle,

a first passage through said body terminating at said nozzle through which water can be sprayed,

a piston free for movement in said first passage between an open position which permits flow through said first passage and a closed position which stops flow through said first passage,

said piston having a front end and a back end, said front end being adapted to enter said first passage to stop flow therethrough when it assumes a closed position as aforesaid,

a pressure chamber in said body in fluid communication with the back end of said piston,

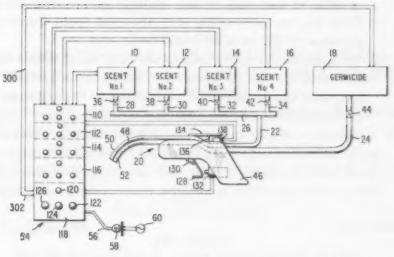
said piston being responsive to a predetermined build up of fluid pressure in said pressure chamber to move from said open position to said closed position,

means responsive to the flow of water through said first passage to build up said predetermined pressure in said pressure chamber over a predetermined period of flow time.

3,891,149
METHOD AND APPARATUS FOR SIMULTANEOUSLY DEODORIZING AND DISINFECTING THE INTERIORS OF VEHICLES

Louis Rendemonti, Point Pleasant Beach, N.J.

Continuation-in-part of Ser. No. 215,546, Jan. 5, 1972, abandoned. This application Sept. 18, 1973, Ser. No. 398,460
Int. Cl. B05b 1/16, 1/30, 7/02
U.S. Cl. 239—70 16 Claims



1. Apparatus for dispersing fluid substances within a vehicle interior comprising:

a. a plurality of atomized fluid dispensing units;

b. a plurality of electrical control units operatively connected with said atomized fluid dispensing units and comprising an electrical control panel;

c. each of said plurality of atomized fluid dispensing units being connected with one of each of said plurality of electrical control units; and

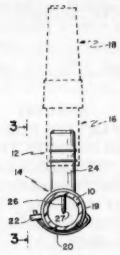
d. each of said electrical control units operable to actuate one of said plurality of fluid dispensing units in response to the closing of an included start switch and a simultaneous closing of a normally open switch mounted on a nozzle presented on a terminal end of an atomizing fluid supply conduit leading from said atomized fluid dispensing unit, one of said atomizing fluid dispensing units being connected with one nozzle, and a remaining plurality of the fluid dispensing units being connected with a second nozzle through a manifold common to all said remaining fluid dispensing units, said first and second nozzles being mounted together in a single structure having a pistol hand grip and formed of an arcuate configuration; e. a first switch actuator mounted on said nozzle structure and operable to close a circuit for actuating said one of said atomizing fluid dispenser units; and

f. a second switch actuator mounted on said nozzle structure for closing an electrical circuit for actuating one unit of the remaining plurality of units to dispense an atomized fluid therefrom.

3,891,150
DRIP IRRIGATION DEVICE

John K. Hoff, Houston, and John B. Goss, Tomball, both of Tex., assignors to AG International, Houston, Tex.

Filed Apr. 29, 1974, Ser. No. 465,101
Int. Cl. A62c 23/06
U.S. Cl. 239—272 7 Claims

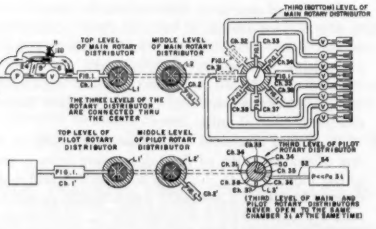


1. An emitter apparatus for dispensing fluid from an irrigation system at a selected rate, including,
   a. a tubular emitter body cone having
      1. a hole in the wall of the emitter body cone allowing fluid to pass outwardly therethrough from the interior portion of the emitter body cone and
      2. At least one longitudinal groove on the exterior wall of the emitter body cone extending substantially the length of the emitter body cone and to the enclosed end of the emitter body cone, and
   b. a tubular emitter cap releasably secured to the emitter body cone for receiving the fluid from said emitter body cone, and, in conjunction with the groove of the emitter body cone, provides a volume restricting passageway.

3,891,151
PILOT INJECTION FUEL INJECTION PUMP

Merle Robert Showalter, 205 Robins Loop, Waco, Tex. 76705

Filed May 1, 1974, Ser. No. 466,036
Int. Cl. F02m 39/00
U.S. Cl. 239—533 7 Claims

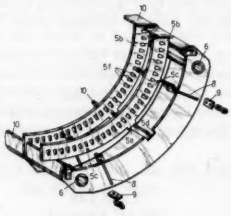


5. A timed, pulsed fuel injection system including a main injection system and a pilot injection system which injects fuel pulses through *n* lines L1, L2 ..., L*n* connected to *n* nozzles in a repeating sequence comprising:
   means to inject main injection pulses through each of said *n* lines; and
   wherein the pilot injection system comprises:
   a. pilot accumulator chambers (4) and (5);
   b. means to meter pressurized fuel flow continuously to pilot accumulator chamber (4);
   c. third switching means to open and close fluid flow between the pilot accumulator chambers (4) and (5) and a fourth switching means to open and close flow between pilot accumulator chamber (5) in succession to lines L1, L2, ...L*n*, where said third and fourth switching means open and close fluid contact between the chambers and lines in the sequence 4–5, 5–L1, 4–5, 5–L2, ...4–5, 5–Ln;
   d. where accumulator chambers (4) and (5) have a volume versus pressure function $V_i(P_i)$ such that $dv_i/dp_i = 0$ if pressure p_i in chamber i is less than a set pressure p_{ni}, where dv_i/dp_i is large if $p_i > p_{ni}$ and where accumulator pressures p_{ni} are related so that $P_{n4} > P_{n5}$ and where p_{n5} is greater than the opening pressure of any of the *n* nozzles; and
   e. wherein said main injection system and said pilot injection system are timed so that chamber (5) is not in contact with a line Li when the main injection system is injecting fuel into said line Li.

3,891,152
GRATE BASKET FOR HAMMER CRUSHERS

Kurt Guggenheimer, Ennigerloh, Westphalia, Germany, assignor to Gebruder Hischmann Maschinenfabrik, Ennigerloh, Westphalia, Germany

Filed Aug. 8, 1973, Ser. No. 386,733
Claims priority, application Germany, Aug. 9, 1972, 2239099
Int. Cl. B02c 13/284
U.S. Cl. 241—88.4 8 Claims



1. A grate basket for hammer crushers, which includes a rotor, at least two segmental members, each of said segmental members comprising a plurality of subdivided wall members arranged parallel and in spaced relationship to each other and being located coaxially with regard to said rotor, a plurality of grate bars extending substantially parallel to the axis of said rotor, connecting means extending in the axial direction of said grate basket and being exchangeably connected to said wall members, said subdivided wall members respectively comprising a base wall and bar carrier means, said connecting means supporting said base walls, and said grate bars being supported by said bar carrier means, and means for preventing said bar carrier means from moving in the circumferential direction of said rotor and from displacement in axial direction, said bar carrier means being readily interchangeable and detachably connected to said base walls.

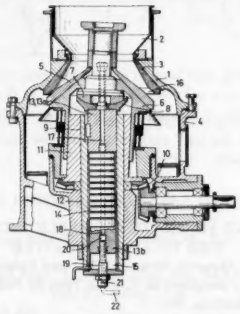
3,891,153
LUBRICANT FEED MEANS FOR GYRATORY CRUSHERS

Hanns Decker; Heinz Hurtmanns, both of Cologne, and Helmut Stockmann, Wesseling, all of Germany, assignors to Klocker-Humboldt-Deutz, AG, Germany

Filed Dec. 29, 1970, Ser. No. 102,446
Claims priority, application Germany, Jan. 12, 1970, 2001073
Int. Cl. B02c 2/04
U.S. Cl. 241—214 1 Claim

1. A gyratory crusher, comprising
   a. a housing having a feed opening at the top thereof,
   b. a crusher lining secured to said housing adjacent said top opening therein,

c. a tubular support post stationarily mounted in an upright position within said housing and having a closed bottom end,
d. a piston mounted in said tubular support post for movement axially thereof,
e. a rotary crusher cone mounted on the upper end of said piston,
f. a substantially dish-shaped friction bearing between said crusher cone and said upper end of the piston,
g. eccentric means associated with said rotary crusher cone and support post to impart to said crusher cone a wobbling movement,



h. means for supplying highly pressurized fluid to the variable size chamber formed by the bottom end of said piston and said closed bottom end portion of the support post to thereby control the size of the gap between the crusher lining and the crusher cone,
i. a conduit extending axially through said piston from said friction bearing to the bottom end of the piston,
j. a tubular member secured to the bottom closure of said support post and extending through said closure into said conduit in the piston in sealed slidable engagement with the wall of said conduit, and
k. means for supplying low pressure lubrication fluid to the outer end of said tubular member and thereby to said friction bearing.

3,891,154

LUBRICATED YARN GUIDE FOR YARN SPOOLING MACHINE

Ernst Dietiker, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

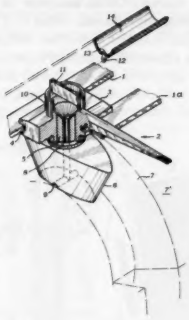
Filed Jan. 9, 1974, Ser. No. 431,929

Claims priority, application Switzerland, Feb. 1, 1973, 1438/73

Int. Cl. B65h *54/30*

U.S. Cl. 242—43 **7 Claims**

1. In yarn spooling traverse apparatus having yarn guide track means (**1**, **1***a*);
a yarn guide track element (**2**, **3**) movable along the guide means;
means (**7'**) formed with a spiral track groove (**7**);
and a rotatable follower (**6**) having one end engaged in the groove (**7**) and the other end connected to the guide element to move the guide element, upon rotation of the means (**7'**) formed with the groove (**7**) in a reciprocating traverse path;
a lubrication system to lubricate the follower (**6**) in the groove (**7**) comprising
a duct (**8**) formed in the follower (**6**) and extending through the follower and to the root of the spiral track groove (**7**);
a lubricant supply (**14**) having a drip opening (**13**) therein of such dimension that lubricant drops will form thereat, and located adjacent the path of movement of the follower (**6**);



and drop strip-off means (**11**) located to move with the follower adjacent the end of the duct (**8**) remote from the groove (**7**) extending towards the drip opening, to strip off lubricant drops upon passage of the follower past the drip opening.

3,891,155

METHOD AND APPARATUS FOR CONTROLLING A WINDING DEVICE FOR A CONTINUOUSLY SUPPLIED FIBER SLIVER

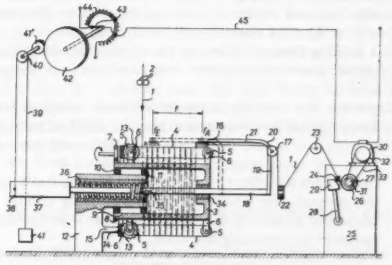
Werner Naegeli, Winterthur, Switzerland, assignor to Pavena AG, Basel, Switzerland

Filed June 12, 1972, Ser. No. 262,028

Claims priority, application Switzerland, June 19, 1971, 9003/71

Int. Cl. B65h *59/38*

U.S. Cl. 242—45 **20 Claims**



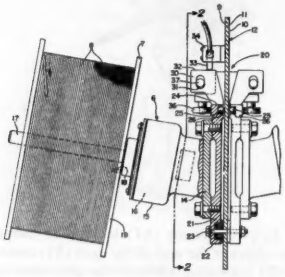
1. A method of controlling the winding of a continuously supplied fiber sliver on a bobbin by a winding device wherein the winding phase is interrupted by a standstill phase of the winding device during a bobbin change, including the steps of:
a. continuously building-up a fiber sliver reserve onto a moving drum surface from the continuously supplied fiber sliver without winding of the sliver during the standstill phase and moving said fiber sliver along the axis of the drum in the direction of said bobbin;
b. controlling the tension of the fiber sliver during said standstill phase;
c. reducing the built-up fiber sliver reserve during the winding phase; and
d. controlling the winding tension during the winding phase as a function of the bobbin diameter and the rotational speed as a function of the reduction of the fiber sliver reserve.

3,891,156

MECHANISM FOR DETECTING TRAPPED CORDS ON A CREEL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 7, 1973, Ser. No. 395,330
Int. Cl. B65h *63/04, 59/04*
U.S. Cl. 242—54 R 22 Claims



1. A mechanism for stopping rotation of a spool of cord on a creel when the cord paying out from the spool becomes trapped on the spool, comprising in combination:

a. a support for the spool, including:

I. a rotatable pivot arm, and

II. a spindle carried by the pivot arm and having a longitudinal axis about which the spool rotates, the longitudinal axis of the spindle being angularly disposed to a vertical plane;

aa. means for mounting the pivot arm for rotation in the direction which cord pays out from the spool, whereby the spool and spindle carried by the pivot arm, are displaceable from a position where the cord normally pays out from the spool;

b. means for stopping rotation of the spool in response to displacement of the spindle and spool from the position where the cord normally pays out from the spool;

c. a braking device carried by the support for producing an initial tension in the cord as it pays out from the spool; and

d. means for exerting a predetermined, constant biasing force against the pivot arm to prevent displacement of the spindle and spool, until tension in the cord paying out from the spool reaches a predetermined level where it overcomes the effect of the constant biasing force against the support, the tension at said level being greater than the initial tension in the cord and lower than the tension required for breaking the cord.

3,891,157

SLITTING MECHANISM FOR WINDER

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed June 4, 1973, Ser. No. 365,994
Int. Cl. B26f *3/00*
U.S. Cl. 242—56.2 16 Claims

1. A slitter winder for slitting and winding a web such as paper into a plurality of rolls comprising in combination:

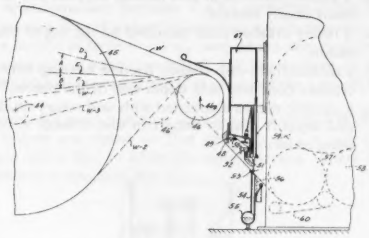
means suppling a traveling web;

guide means for the web guiding it through a slitting zone;

a slitting means in the slitting zone having first and second jets on one side of the web for directing high velocity working fluid streams through the traveling web surface spaced laterally for removing a narrow kerf portion from the web to separate adjacent web strips;

a winder positioned to receive and wind said strips into adjacent rolls;

and a receptacle means positioned on the opposite side of the web positioned for receiving the fluid of the jets and



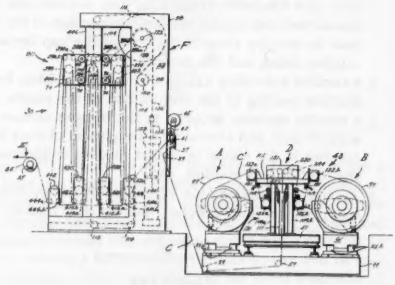
for receiving the narrow kerf portion removed from the web with the kerf carried toward the receptacle by the fluid streams.

3,891,158

METHOD AND APPARATUS FOR SPLICING A STANDBY WEB TO A RUNNING WEB

Michael Hillas Shearon, Newark, Del., and Roland Leroy Besel, Lugoff, S.C., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed July 13, 1973, Ser. No. 378,968
Int. Cl. B65h *19/18*
U.S. Cl. 242—58.1 13 Claims



3. The method of claim 2 further comprising the step of maintaining the web speed substantially constant after said intermediate low value of web speed is reached until the web tail is grasped by the clamp means.

3,891,159

GUIDE ROLLER BIASING SHIM LINER

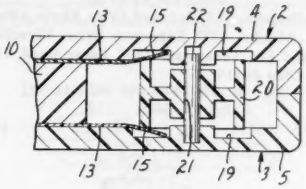
Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 354,170, April 25, 1973, abandoned. This application Mar. 20, 1974, Ser. No. 452,725
Int. Cl. G11b *23/10*
U.S. Cl. 242—199 5 Claims

1. A shim liner for a magnetic tape cassette having a case with spaced apart sidewalls, a pair of rotatable tape supporting spools, each journaled on cylindrical ribs at openings in said sidewalls, which sidewalls are formed with two pairs of opposed recessed areas, each pair adjacent one of said spools and positioned near one edge of the periphery of said case, and a tape guide roller rotatably mounted from the sidewalls at each pair of opposed recesses, which liner comprises:

a resilient sheet positioned between the tape supporting spools and one of the sidewalls of said case and having a low friction surface facing said tape supporting spools,

said sheet having a pair of openings through which the ribs of said sidewalls protrude and a pair of integral, outwardly extending portions, each overlying at least part of one of the recessed areas of said sidewalls and extending between one end of one of said tape guide rollers and the sidewall at said recessed area for exerting a biasing force on said one of said rollers due to the resiliency of the sheet.

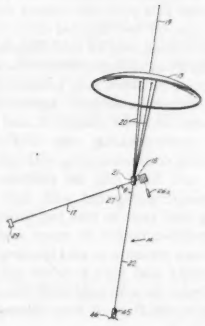


3,891,160

MICROWAVE POWERED REUSABLE ORBITING SPACE TUG

Michael A. Minovitch, 2832 St. George St., Los Angeles, Calif. 90027

Filed Mar. 21, 1973, Ser. No. 343,197
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 SS **10 Claims**



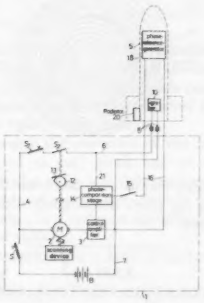
1. A microwave powered reusable space tug comprising:
a structural beam;
means on one end of the structural beam for engaging and propelling another space vehicle;
propulsion nozzle means on the structural beam for propelling the tug;
an absorption chamber connected to the nozzle means;
tank means on the structural beam for containing a propulsion fluid;
means for conveying fluid from the tank means to the absorption chamber;
a microwave antenna for receiving and concentrating a microwave beam;
pivot means for interconnecting the antenna and the structural beam for pivoting about an axis transverse to the longitudinal axis of the beam and keeping the antenna pointed at the microwave beam independently of the direction of the propulsion nozzles; and
wave guide means for conveying a concentrated microwave beam from the antenna focus through the pivot means to the absorption chamber for absorption by the propulsion fluid.

3,891,161

OPTICAL POSITION DETERMINING DEVICE FOR CONTROLLING A SPIN STABILIZED FLYING BODY

Joachim Hermann, Munich, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Germany

Filed June 14, 1965, Ser. No. 464,270
Claims priority, application Germany, June 19, 1964, 77311
Int. Cl. F42b *15/04*
U.S. Cl. 244—3.12 **6 Claims**



1. In an optical position determining device controlling a spin stabilized flying body having electrical launch-initiating ignition means and a radiator to whose radiation the position determining device is responsive, the position determining device including an adjustable speed motor rotating its image field scanning means: apparatus for synchronizing the image field scanning with the spin of the flying body comprising, in combination, an ignition current circuit for said ignition means; switch means controlling closure of said circuit; and triggering means periodically operable by said motor at a rate corresponding to the motor speed, anad controlling said switch means in a manner such that said flying body, when launched, spins about its longitudinal axis with an angular velocity equal to that of said scanning means and with a predetermined phase relation to the latter.

3,891,162

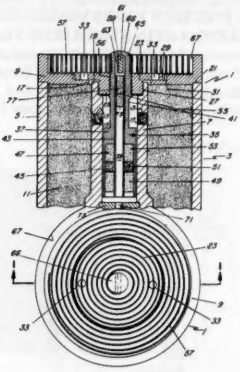
DELAY DETONATOR WITH BY-PASS EXPLOSIVE BOLT SYSTEM

William G. Wolterman, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 4, 1974, Ser. No. 430,958
Int. Cl.[2] F42B *25/10*
U.S. Cl. 244—3.25 **9 Claims**

1. In an explosive projectile comprising a hollow annular housing containing a main explosive charge and including an inner wall through which at least one explosive lead extends, a single igniting means and a dispensable element adapted to be separated from the projectile after it has performed its function but before the main explosive charge is exploded, a fuze comprising:
A. a first firing train mounted within said inner wall and comprising combustible delay means and first explosive means interposed between and connecting said igniting means with said explosive lead, for initiating said main explosive charge at a predetermined time after ignition of said igniting means; and

B. a second firing train comprising second explosive means disposed adjacent to said dispensable element for separating said element from said projectile, and means connecting said igniting means with said second explosive means for initiating the latter immediately after ignition of said igniting means.

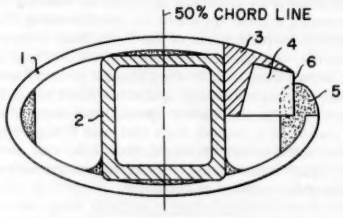


3,891,163

CIRCULATION CONTROL AIRFOIL

Joseph B. Wilkerson, Damascus, and Drew W. Linck, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 11, 1974, Ser. No. 460,004
Int. Cl. B64c *3/50*
U.S. Cl. 244—42 CD **1 Claim**



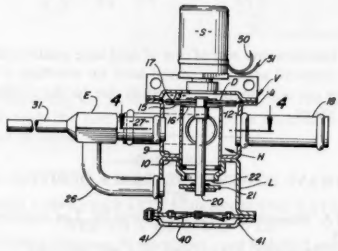
1. A circulation control airfoil comprising:
a longitudinal spar tapered in height, width, and wall thickness along its length to attain a tuned stiffness;
a blunt airfoil leading edge attached to said spar;
a blunt airfoil trailing edge attached to said spar;
a slot blade attached to said spar such that slot blade forms a smooth junction with one of said blunt airfoil edges;
one of said blunt airfoil edges further including a Coanda surface for receiving circulation control blowing;
said Coanda surface and said slot blade forming a blowing slot for said circulation control blowing;
said spar forming a plenum passage for supplying blowing fluid to said blowing slot and having a plurality of holes and slots along its length of such size and placement to attain a tuned stiffness and a controlled quantity of fluid to said blowing slot;
at least a part of said longitudinal spar located at the 50% chord location of said airfoil; and
a rib support structure attached to said slot blade and to a portion of said one of said blunt airfoil edges whereby said rib support maintains the geometric rigidity of said one of said blunt airfoil edges, said rib support structure including adjustment means for adjusting the height of said blowing slot.

3,891,164

DUPLEX VALVE

Thomas P. Hertrick, 859 Sherwood Drive, Elyria, Ohio 44035; James L. Mitiska, 4397 Edgewater Drive, Vermilion, Ohio 44089, and Leo Tobacman, 2495 Eaton Road, University Heights, Ohio 44118

Filed Nov. 19, 1973, Ser. No. 416,922
Int. Cl. B64d *15/18*
U.S. Cl. 244—134 A **16 Claims**



1. A duplex valve for changing fluid pressure in a confined space quickly, said space including an inner cylindrical housing having ports spaced at opposite ends, a first port at one end and a second port at the opposite end, closures for said ports for opening said first port and closing the second, pressure responsive means for moving said closures, a first chamber embracing said means, one of said closures and a first of said ports and being divided into near and far portions by said means, a bleed orifice between said portions tending to balance the pressure therein, a second chamber embracing the other of said closures, and the second of said ports, a source of high pressure communicating with said near portion, a source of low pressure communicating with said second chamber, a controlled vent from said far portion to a region of relatively low pressure compared with said high pressure, means for opening said vent to bias the pressure exerted on said pressure responsive means to open said first port and admit fluid under high pressure to said housing and said space, and means for closing said vent to close said first port and open said second port to evacuate said space, each closure being removed from the flow of fluid through the opposite port.

3,891,165

RETRIEVAL ASSEMBLY

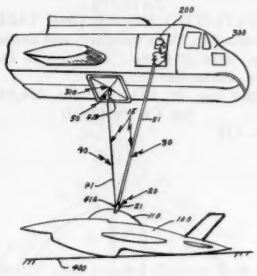
Douglas B. Day, and Welfred A. Stahl, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1973, Ser. No. 423,855
Int. Cl. B64d *3/00*
U.S. Cl. 244—137 R **8 Claims**

1. A retrieval assembly, in combination with an airborne vehicle capable of hovering, for use in retrieving a downed drone airborne vehicle having hookable means attached to it, wherein the hoverable airborne vehicle has a cargo hook and is capable of lifting, supporting, and carrying the downed drone airborne vehicle by suspension thereof, comprising:
a. a hook subassembly which includes a hook by which the hookable means of the downed drone airborne vehicle may be releasably hooked;
b. a pole subassembly which includes a pole having a fore end and an aft end, with said fore end removably attached to said hook of said hook subassembly;

c. a recovery cable subassembly which includes a recovery cable having a fore end and an aft end, with said fore end connected to said hook of said hook assembly;

d. and, a swivel subassembly which includes a swivel having a fore portion and an aft portion, with said fore portion connected to said aft end of said recovery cable, and with said aft portion of said swivel releasably connected to the



cargo hook of the hoverable airborne vehicle, and also with said aft portion removably attachable to said fore end of said pole of said pole subassembly;

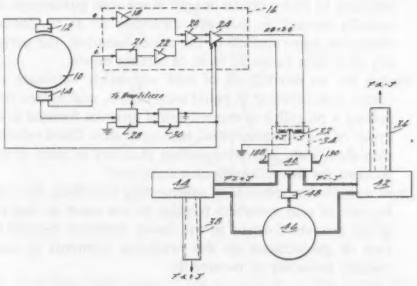
whereby the hookable means of the downed drone airborne vehicle is hooked and secured by and with said hook of said hook subassembly, and thereby the downed drone airborne vehicle may be lifted, supported, and carried by the hoverable airborne vehicle by suspension thereof.

3,891,166

MISSILE DIRECTIONAL CONTROL SYSTEM

Robert F. May, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 28, 1963, Ser. No. 286,100
Int. Cl. F42b *15/02*
U.S. Cl. 244—3.22 **16 Claims**



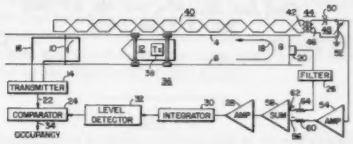
1. An attitude control system for maintaining a missile on a launch predetermined path comprising means mounted on the missile for indicating a deviation from said predetermined path including means for providing an output signal representative of angular position change; and means for providing an output signal representative of angular rate change means for modifying said angular position change signal by multiplying it by a factor "a" whereby a $\cong[(T-D)/(k/p)-1]$, an algebraic summation means responsive to said modified position and rate change signals and operable to provide a combined output representative of their algebraic summation, and means operatively connected to and controlled by the output of said summation means, said last mentioned means operable to provide a corrective force to return the missile to its predetermined path.

3,891,167

VEHICLE PRESENCE DETECTION IN A VEHICLE CONTROL SYSTEM

Robert H. Perry, Cannonsburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 31, 1974, Ser. No. 475,231
Int. Cl. B61l *25/02*
U.S. Cl. 246—34 R **11 Claims**



1. In a vehicle control system for determining the presence of a vehicle along a conductive track divided into a plurality of track circuit blocks, the combination comprising:

means for introducing a vehicle control signal into a given one of said track circuit blocks;

means for sensing the presence of the introduced vehicle control signal in said given one of said track circuit blocks, with the sensed vehicle control signal being at a given signal level during the absence of said vehicle and normally being at a reduced signal level during the presence of said vehicle;

means for transmitting a vehicle presence signal from said vehicle; and

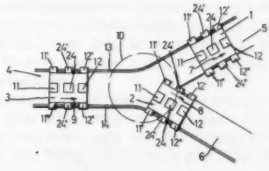
means for altering the information content of the sensed vehicle control signal in response to sensing the transmission of said vehicle presence signal.

3,891,168

APPARATUS FOR SAFEGUARDING THE SPACING BETWEEN SUCCESSIVE BODIES, ESPECIALLY VEHICLES ON A TRACK

Peter Kraus, Munich, Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Germany

Filed Nov. 2, 1973, Ser. No. 412,254
Claims priority, application Germany, Nov. 9, 1972, 2254799
Int. Cl. B61 *3/22*
U.S. Cl. 246—167 R **10 Claims**



1. An apparatus for safeguarding the spacing between successive bodies, especially vehicles on a track including a track junction with track branches extending into different directions, comprising transmitter and receiver means on each body for measuring the spacing between adjacent bodies, first and second homogenous electrical conductor means having a predetermined signal attenuation, and extending along said track and including respective conductor portions extending along said track branches, coupling means operatively arranged for coupling said transmitter and receiver means to that electrical conductor means and portion thereof extending along the track branch on which the body is intended to travel, and further electrical conductor means interconnecting said first and second conductor means at predetermined intervals therealong, said further electrical conductor means starting at

least at the beginning of said junction in the track and continuing to the end of an area where a body leaves the junction, said signal attenuation determining the distance of signal transmission.

3,891,169

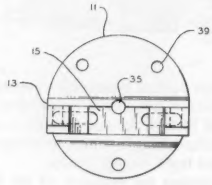
MODEL AIRPLANE ADJUSTABLE MOTOR MOUNT

Emelio Tremarco, 17 Speer Pl., Nutley, N.J. 07110

Filed Jan. 28, 1974, Ser. No. 437,309

Int. Cl. F16m *13/00*

U.S. Cl. 248—5 **14 Claims**



1. An adjustable motor mount for model airplane engines comprising:

a. an essentially flat base member having a regular shape and having a first channel formed in the surface of one side thereof with an edge of the channel passing through the center of said base member;

b. first and second jaws slidably mounted in said channel, said jaws extending outward perpendicular to said base member a distance sufficient to permit mounting a model airplane engine thereon; and

c. means for securing said jaws in place within said channel.

3,891,170

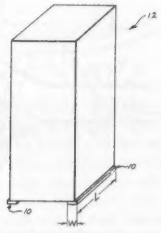
SHIPPING SKID

Francis G. Bricker, Shelbyville; Jack L. Isaacs, and Douglas C. Nobbs, both of Louisville, all of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 19, 1974, Ser. No. 498,557

Int. Cl. B65d *19/00*

U.S. Cl. 248—119 **8 Claims**



1. A shipping skid comprising:

an elongated rectangular body having a longitudinal axis, a base, and a peripheral edge flange extending in a first direction substantially normal to said base;

first and second bosses each positioned adjacent a respective end of the body and extending in the first direction from the base;

a plurality of spaced-apart minor flanges each extending laterally across the base and extending in the first direction and connecting opposed portions of the peripheral edge flange;

a network of major flanges each extending in the first direction from the base, said network being spaced from the peripheral flange, extending generally along the axis, and connecting the bosses, said peripheral flange, bosses, and major flanges being of a substantially common height; and

first and second end flanges each being connected to the peripheral flange and a respective boss and extending in the first direction from the base.

3,891,171

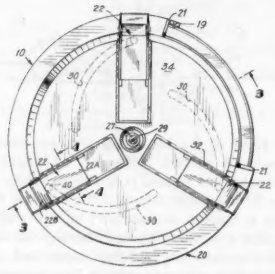
MULTI-BOWL SUPPORTING TABLE

Maurice P. Samuelian, West Hartford, and Benjamin Buckler, Manchester, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,053

Int. Cl. B01f *9/10*

U.S. Cl. 248—131 **5 Claims**



1. A bowl-supporting turntable for a food mixer comprising in combination:

at least two interfitting or nesting saucer-shaped members mounted for rotation together on a common axis in response to rotation of a mixing bowl, the upper one of said members being provided with guideways at its inner surface;

a plurality of selectively adjustable retaining elements adapted to move continuously along said guideways in a radially inward or outward direction so as to contact, along the inner surface of the upper member, the periphery of a wide range of sizes of mixing bowls;

means for so moving all of said adjustable retaining elements concurrently in equal increments, said means comprising a plurality of spaced spiral grooves formed in the lower of said members and, in cooperative fitted relationship therewith, a corresponding plurality of pins or projections on the retaining elements; and

means, at the peripheries of said nesting members, for rotating one of said members relative to the other so that said spiral grooves formed in the lower member compel the pins or projections on the retaining elements to move radially inwardly or outwardly.

3,891,172

SUPPORT MEMBER HAVING A LOCKING CAM

Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.

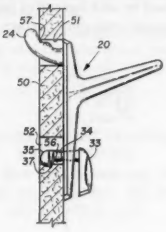
Filed Jan. 21, 1974, Ser. No. 435,193

Int. Cl. A47f *5/00;* **E06b** *7/28*

U.S. Cl. 248—223 **22 Claims**

1. A support member adapted for mounting on a multi-apertured panel, comprising a base member having a flat surface, article holding means extending from said base member on a side thereof away from said flat surface and spaced from one end of said base member, a projection extending from said flat surface, an aperture extending through said base member to said flat surface and spaced from said projection in a direction away from said one end of said base member, a shaft rotatably

mounted in said aperture, whereby one end of said shaft extends beyond said flat surface and the other end extends beyond said other surface of the base member, cam means on said one end of said shaft, said cam means having a substantially round cross-section in a plane normal to the axis of said shaft that is offset in one direction with respect to the axis of the shaft, a sharp radially extending circumferential edge on



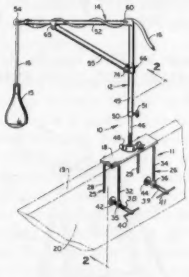
the portion thereof at the greatest distance from the shaft, and manually operable handle means on the other end of said shaft, said cam means having a surface toward said flat surface that is inclined with respect to said flat surface for wedging a panel upon which said support member is mounted between said flat surface and the inclined surface of said cam means upon rotation of said shaft.

3,891,173

LIGHT SUPPORT FOR BOATS

James P. Ellis, 2550 Wedgefield Ct., Columbus, Ga. 31906, and William G. Ridgeway, 4321 Searcy St., Columbus, Ga. 31907

Filed Feb. 11, 1974, Ser. No. 441,230
Int. Cl. F16m *13/00*
U.S. Cl. 248—226 A **3 Claims**



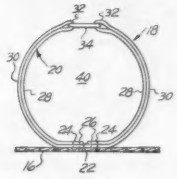
1. A fishing light support for mounting on the upper horizontal surface of the bulkhead of a boat or the like comprising a base member for positioning on the upper horizontal surface of a bulkhead, a pair of approximately U-shaped clamp members each including approximately parallel leg segments and an interconnecting pin segment, said clamp members each being foldably connected to said base member at its interconnecting pin segment with its leg segments extending from opposite side portions of said base member whereby said clamp members are foldable between downwardly extending positions with their leg segments positionable on opposite sides of a bulkhead for mounting on the bulkhead and laterally extending positions with their leg segments folded approximately parallel to said base member for storage purposes, a stationary mast releasably connected at its lower end to and extending normal to said base member, a movable mast member mounted at its lower end on said stationary mast member and rotatable with respect to and axially movable with respect to said stationary mast member, locking means carried at the lower end of said movable mast member and constructed and arranged to lock said movable mast member in a fixed position with respect to said stationary mast member, a boom pivotally connected at one of its ends to the upper end of said movable mast member and normally extending laterally from the upper end of said movable mast member, a boom support strut pivotally connected at one of its ends to a fixed position on said boom and pivotally connected at the other of its ends to said movable mast member and movable along the length of said movable mast, and means for supporting a light element or the like at the distal end of said boom.

3,891,174

CARRIER-ATTACHED EXPANSIBLE CONTAINER HOLDER

Louis A. Harvey, 15107 Ilene, Detroit, Mich. 48238

Filed Sept. 30, 1974, Ser. No. 510,411
Int. Cl. A47k *1/08*
U.S. Cl. 248—313 **9 Claims**



1. An expansible container holder adapted to be attached to an article carrier, said holder comprising

a container gripper adapted to flexibly embrace the container, said gripper including

an elongated flexible member having opposite ends and a midportion secured adjacent one another in a substantially common attachment portion adapted to be secured to a portion of the article carrier,

said flexible member including a pair of loops thereof extending away from said attachment portion,

and coupling means interconnecting said loops in slidable engagement therewith and dividing said loops into outer and inner sections thereof,

said coupling means being movable into a first position remote from said attachment portion disposing said outer and inner loop sections adjacent one another and thereby forming a single double-ply container-gripping loop,

said coupling means being movable into a second position near said attachment portion disposing said outer and inner loop sections remote from one another and thereby forming a pair of single-ply container-receiving loops disposed side by side.

3,891,175

TRAFFIC SIGNAL HANGER

William L. Hawley, Rexdale, and Terence E. Lewis, Mississauga, both of Canada, assignors to GTE International Incorporated, Stamford, Conn.

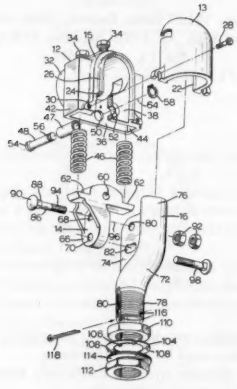
Filed Oct. 4, 1974, Ser. No. 511,992
Claims priority, application Canada, Mar. 19, 1974, 195416
Int. Cl.[2] B42F *13/00*
U.S. Cl. 248—317 **3 Claims**

1. A traffic signal hanger comprising:

an elbow member having passage means extending therethrough, said passage means having openings at the first and second ends of said elbow member disposed substantially at right angles to one another, said passage means having a portion extending inwardly from said opening in

said first elbow member end and being adapted to receive a support arm of a traffic signal standard whereby said elbow member may be mounted on a support arm of a traffic signal standard;

first hanger bracket means pivotably mounted on said elbow member for movement about a first generally horizontal axis, said first hanger bracket having a portion projecting downwardly from said second end of said elbow member; return spring means operatively positioned between said elbow member and said first hanger member for interaction therebetween to resist rotation of said first hanger member with respect to said elbow member about said first generally horizontal axis and to return said first hanger bracket to its downwardly extending position with respect to said elbow member following deflection of said first hanger bracket means;



second hanger bracket means pivotably mounted on said first hanger bracket means for movement about a second generally horizontal axis disposed at right angles to said first generally horizontal axis, said second hanger bracket means having passage means opening therethrough, one end of said passage means of said second hanger bracket communicating with said passage means opening in said second end of said elbow member, the other end of said passage means of said second hanger bracket being disposed below said first hanger bracket;

releasable locking means for locking said second hanger bracket against rotation with respect to said first hanger bracket in a predetermined position; and

mounting means at said other end of said passage of said second hanger bracket means for securing a traffic signal housing thereto.

3,891,176

HANGER FOR SUSPENDING EXHAUST PIPES FROM A HORIZONTAL SUPPORT

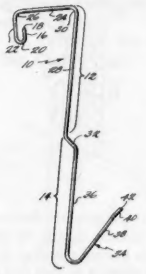
Todd R. Downing, and Robert K. Nolen, both of Chicago, Ill., assignors to Maremont Corporation, Chicago, Ill.

Filed Nov. 21, 1973, Ser. No. 418,035

Int. Cl. A47j *51/142;* **A47f** *5/00;* **A47j** *5/00*

U.S. Cl. 248—340 **14 Claims**

1. A hanger for suspending exhaust pipes and the like from a horizontally extending support comprising an elongated metallic member formed to provide a support engaging section and a pipe engaging section, said support engaging section being operable to be engaged in a generally downward direction over the support into an operative pipe suspending position with respect thereto, said support engaging section including a terminal end portion for engaging one side portion of the support when said support engaging section is disposed in said operative position, said terminal end portion including end surface means which faces generally upwardly when said support engaging section is disposed in said operative position, said support engaging section including integral portions disposed between said terminal end portion and said pipe engaging section which extend upwardly with respect to the aforesaid one side portion of the support transversely over an upwardly facing portion of the support and downwardly along an opposite side portion of the support when said support engaging section is disposed in said operative position, said integral portions having support engaging surface means operable in



response to the suspension of a pipe or the like by engagement with said pipe engaging section for causing the downward force of the pipe load to be transmitted by said integral portions to said terminal end portion in such a way as to tend to move said end surface means in a direction upwardly and toward the one side portion of the support an extent which increases as the pipe load increases so that the resultant engagement of said end surface means with the one side portion of the support serves to prevent disengagement of said support engaging section from the support.

3,891,177

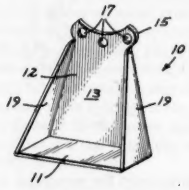
SUPPORT MEANS FOR WHEELED VEHICLES

Raymond M. Jerrel, 300 N. Strevell Ave., Miles City, Mont. 59301

Filed Apr. 23, 1973, Ser. No. 353,346

Int. Cl.² F16M *11/00, 13/00;* **E04G** *25/00*

U.S. Cl. 248—352 **6 Claims**



1. In the combination of a truck weighing more than three tons having at least one wheel removed, an exposed wheel hub assembly where a said wheel has been removed, at least three circular cross-section elongated fastening means for fastening the wheel to the exposed hub assembly, and a supporting means for maintaining the truck in a generally raised attitude with respect to the surface on which the truck rests, a support means which comprises:

a generally flat, horizontally extending base portion resting on the surface on which the truck rests,

an elongated multi-sided upright support member, integral with said base portion, extending upward from said base portion up to about the lower periphery of an exposed hub assembly of the truck, said multi-sided support mem-

ber comprising a generally trapezoidal middle portion and two generally triangular side panels integral with and extending from the side edges of said middle portion, and an arcuate upper flange portion for fastening of said multi-sided upright support member to said exposed hub assembly, said upper flange portion having an arcuate arrangement of three circular holes therein, circumferentially equally spaced along an arc concentric with the center of the exposed hub,

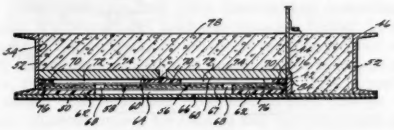
said circular cross-section elongated fastening means being inserted through said circular holes, thereby securing said support means to said exposed wheel hub assembly.

3,891,178

PRECAST PANELS WITH CORNER-DIVIDER PROJECTIONS

Paul S. Kelsey, P.O. Box 103, Forestdale, Mass. 02644

Filed July 16, 1973, Ser. No. 379,313
Int. Cl. B32b *3/08*
U.S. Cl. 249—91 **3 Claims**



1. In combination:

a. a casting box including:

i. a floor and a plurality of upstanding sidewalls arranged about the outer periphery of the floor to define a closed space among them, bottomed by said floor;

ii. a space-dividing wall upstanding from said floor within said space to provide a separator having its farthest extent from the floor closer to the floor than the farthest extent of the upstanding sidewalls is from the floor, the separator extending between two spaced points on said upstanding sidewalls to divide the part of said space nearest the floor into a larger portion on one side of the separator and a smaller portion on the other side of the separator;

b. a removable block means substantially filling the floor area of said larger portion of said space and up to less than the extent of said separator from said floor; whereby, a panel of facing material and hardenable panel backing composition may be cast in situ in the casting box to substantially fill the remainder of said space with said panel, with said panel having edges being molded against said casting box upstanding sidewalls and one face with a first larger portion formed against said block means on said one side of the separator, a second, smaller portion formed against the casting box floor on the other side of said separator and a groove molded therein extending between edges thereof by the inclusion of the separator thereinto between said larger and smaller portions thereof.

3,891,179

HOBBY CASTING MOLD

Morton Berman, Brooklyn, N.Y., assignor to Avalon Industries, Inc., Brooklyn, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,731
Int. Cl. B28b *7/34*; **B29c** *1/00*, *5/00*
U.S. Cl. 249—134 **20 Claims**

1. A two-piece hobby casting mold comprising:

A. two mold sections

i. each having a cavity defining portion,

ii. said cavity defining portions facing each other when the two mold sections are abutted so as to provide a complete mold cavity,

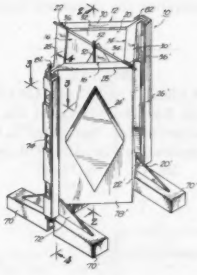
iii. said mold sections mutually defining an open top for the mold cavity,

B. each of said sections having a flat web which extends laterally outwardly and downwardly from said cavity defining portion,

C. said webs being in face-to-face contact when the sections are mutually abutted,

D. and an essentially continuous labyrinth clamp seal extending down the sides and across the bottom of said mold,

i. said seal constituting two halves of which one is in one piece with one of the sections and the other is in one piece with the other section,



ii. a hinge joining at least one of the halves to its associated section,

iii. a different base for each section,

iv. said base being in one piece with the respective sections and having bottoms in a common plane,

v. said sections being of synthetic plastic and the hinge being a living hinge,

vi. in one piece with the respective section,

E. said plastic being translucent so that the level of material within the mold can be seen from outside without looking through the open top, and

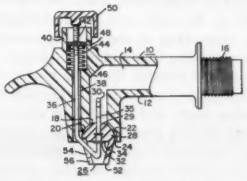
F. the inner surface of said cavity defining portions being slick so that it will not adhere to material introduced into the mold cavity and set therein.

3,891,180

LOW PRESSURE LIQUID DISPENSING VALVE

Jack E. Bebinger, Columbus, Ohio, assignor to Westinghouse Corporation, Pittsburgh, Pa.

Filed Oct. 23, 1973, Ser. No. 408,964
Int. Cl. F16k *47/04*
U.S. Cl. 251—120 **3 Claims**



1. A low pressure liquid dispensing valve having a generally tubular body providing a fluid passage from an inlet end to a discharge end, said inlet end being adapted for attachment to a container and said discharge end defining a downwardly directing outlet, stopper means adjacent said outlet and means mounting said stopper means for guided movement between a first position blocking flow from said outlet and a second position spaced from said outlet and permitting liquid flow

therefrom, with the movement of said stopper means from said first to said second position being in the direction of said flow and said mounting means connected to said stopper at its lower end, said mounting means thereby having a portion extending through the flow path of said discharged liquid, resilient means for normally maintaining said stopper in said first position and manual means for moving said stopper means to said second position wherein the improvement comprises:

fluid directing means comprising a downwardly inwardly converging portion integral with said stopper means and extending therefrom in the direction of said fluid flow generally subadjacent said mounting means and exteriorly of said body for converging the flowing fluid subsequent to the stopper means and said mounting means and thereby concentrating the dispensed liquid into a unified stream.

3,891,181

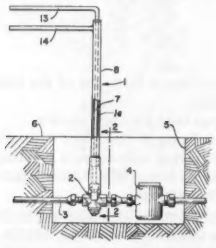
PORTABLE VALVE ACTUATOR

Jerrell Sanders, P.O. Box 566, Hartselle, Ala. 35640

Continuation-in-part of Ser. No. 294,677, Oct. 3, 1972, abandoned. This application Mar. 12, 1974, Ser. No. 450,297

Int. Cl. F16k *31/00*

U.S. Cl. 251—128 **1 Claim**



1. A portable valve actuator for a conventional underground curb stop of the type having an arcuate valve body and T-handle on the valve stem wherein the valve stem is adapted to be turned without large forces being transmitted to the valve body and underground pipes connected thereto to prevent damage thereof, the actuator comprising a pair of coaxial shanks, bushings mounted on each end of the outer shank, the inner shank being rotatably mounted within said bushings, the outer surface of the inner shank being spaced inwardly from the inner surface of the outer shank to thereby form an annular space therebetween, whereby the inner shank is freely slidable therein longitudinally of the outer shank, a pair of spaced, planar parallel, plates forming a bifurcation integrally connected to one end of the inner shank and adapted to straddle the T-handle on the curb stop, a pair of spaced, arcuate plates integrally connected to the corresponding end of the outer shank and extending longitudinally thereof, said arcuate plates having a length greater than the plates on the inner shank, said arcuate plates conforming to the side wall configuration of the valve body and adapted to straddle the valve body such that the arcuate portions engage opposite side walls of the valve body, and portions of the longitudinally extending edges of the arcuate plates engage the inlet and outlet portions of the curb stop, and a handle connected to the opposite end of each shank, whereby when applying the tool to the valve to be actuated, the inner shank is pulled upwardly relative to the outer shank and the upper end of the bifurcation is held against the face of the bushing on the lower end of the outer shank, the arcuate plates are positioned around the underground valve body, the inner shank is then released allowing the bifurcated end to fall freely to thereby straddle the valve T-handle, the curb stop being actuated by applying opposite turning forces to the shank handles while the valve body is held rigid by the arcuate plates and the valve head is rotated by the planar plates.

3,891,182

ARRANGEMENT FOR MAINTAINING A SHIFTABLE MEMBER IN A PLURALITY OF SHIFTED POSITIONS

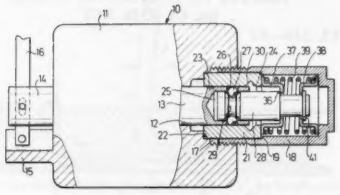
Gunther Schwerin, Moglingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 17, 1973, Ser. No. 407,256

Claims priority, application Germany, Nov. 11, 1972, 2255270

Int. Cl. F15b *13/01*

U.S. Cl. 251—297 **8 Claims**

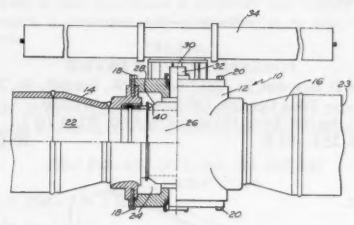


1. In an arrangement of the character described, a combination comprising a housing bounding an interior passage having a longitudinal axis; a first member coaxially accommodated in said passage and having an axially extending first sliding surface and an annular free end portion provided with at least one radially extending through hole; a second member coaxially accommodated in said passage and having an axially extending second sliding surface contacting said first sliding surface and provided with at least one arresting recess, one of said first and second members being stationary with respect to said housing and the other being mounted for movement with respect to said one member so that said sliding surfaces slide on one another; at least one arresting element of circular cross section received in said radial through hole and displaceable therein and having a diameter exceeding the length of the latter; means for moving said other member between at least one arresting position in which said through hole faces said arresting recess and said arresting element is partially received in the latter, and a rest position in which said through hole faces said second sliding surface and said arresting element bears against the same; a third member coaxially accommodated in said passage so as to have a limited degree of movement relative to said first member proportionate to the displacement of said arresting element, and having at least one flanking surface abutting against said arresting element and having a first surface portion closer to said first member and enclosing with said longitudinal axis a first acute angle, and a second surface portion farther away from said first member and enclosing with said longitudinal axis a second acute angle larger than said first acute angle; and means for biasing said third member toward said rest position with attendant abutment of said first surface portion with said arresting element when the latter is received in said arresting recess and of said second surface portion with said arresting element when the latter bears against said second sliding surface, whereby the radial forces acting between said arresting element and said second member when said second surface portion acts on the former are significantly lower than those occurring when said first surface portion acts on said arresting element so that the latter is reliably received in said arresting recess while the friction between the same and said second sliding surface is reduced.

3,891,183
SEALING AND SEAT ASSEMBLY FOR BALL VALVE CONSTRUCTION

Monroe J. Feiring, West Warwick, R.I., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jan. 10, 1974, Ser. No. 432,419
Int. Cl. F16k *25/00*
U.S. Cl. 251—315 10 Claims



1. A trunnion-type ball valve construction, comprising a housing, fluid inlet and discharge passages formed in said housing, a central chamber formed in said housing and normally communicating with said fluid inlet and discharge passages, a ball valve rotatably located in said central chamber for sealing communication between said inlet passage and central chamber, means for rotating said ball valve, said inlet passage having a notch formed therein that defines a rear shoulder, and a seat and sealing assembly located in said notch in said fluid inlet passage for receiving said ball valve in sealing engagement and sealing the fluid inlet passage against leakage into said housing, said seat and sealing assembly including a forward member having a seat formed thereon for receiving said ball valve in sealing engagement thereagainst, a rear member axially spaced from said forward member and firmly engaging said shoulder formed in said notch in said fluid inlet passage, a plurality of sealing rings mounted on said forward member in coaxial, parallel relation for sealing said forward member against said housing, an intermediate member bridging the space between said forward and rear members and engaging said sealing rings, a plurality of springs interposed between said rear and intermediate members for urging said intermediate member into firm engagement with said sealing rings, wherein said sealing rings seal said seat and sealing assembly against said housing.

3,891,184
MULTI-PURPOSE LIFT DEVICE

Meredith Fields, 515 E. 7th St., Newport, Ky. 41071

Filed July 1, 1974, Ser. No. 484,715
Int. Cl. B60p *1/02, 1/22;* B66c *23/60*
U.S. Cl. 254—4 R 7 Claims

1. A multi-purpose lifting device for easy and convenient lifting of heavy, bulky objects, said device comprising, in combination:

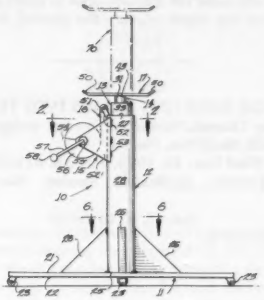
a base;

an outer hollow open ended tube having a top end and bottom end, said tube vertically mounted on the base with the bottom end thereof afixed to said base, a passage way extending axially through said tube, said outer tube being generally cylindrical in cross section and having a first pulley afixed to the top end thereof;

a middle hollow open ended tube having a top end and a bottom end, said middle tube being telescopically received through said top end of said outer tube in said outer tube passage way, the middle tube having a passage way extending axially therethrough, said middle tube being of a generally cylindrical configuration, said middle tube having a second pulley afixed to the bottom end portion thereof in vertical alignment with said first pulley;

an inner hollow open ended tube having a top end and a bottom end, said inner tube telescopically received in said middle tube passage way through said top end thereof, a third pulley in alignment with said second pulley and spaced vertically thereabove and rotatably mounted in said middle tube passage way, a fourth pulley in horizontal alighment with said second pulley and a fifth pulley rotatably mounted on the top end of said middle tube in vertical alignment with said fouth pulley, an aperture adjacent said bottom end of said inner tube and disposed substantially vertically beneath said fifth pulley;

spacer means maintaining said middle tube in spaced relation with respect to said inner and outer tubes and maintaining said inner tube in spaced relation with respect to said middle tube;



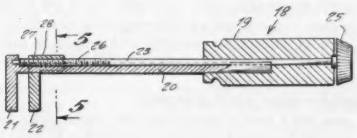
winch means mounted to the exterior of said outer tube and rotatably supporting a drum thereon; and

a cable having one end thereof afixed to said drum, said cable being wrapped thereabout with the opposite end thereof being reeved over the top end of said outer tube and about the bottom end of said middle tube and over the top end of said middle tube and afixed to the bottom end of said inner tube such that rotation of said drum in a first direction will effect the simultaneous telescopic outwardly movement of said middle and inner tubes relative to said outer tube while also effecting the simultaneous telescopic movement of said inner tube out of said middle tube, and rotation of said drum in the opposite direction will effect the telescopic retraction of said inner and middle tubes into said outer tube.

3,891,185
BRAKE SHOE HOLD DOWN SPRING TOOL

Laurence W. Lett, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed June 25, 1973, Ser. No. 372,990
Int. Cl. B66f *11/00;* B25b *27/00*
U.S. Cl. 254—10.5 1 Claim



1. A brake shoe spring tool, comprising a cylindrical shank having a handle mounted encompassingly on one end of said shank and a fixed spur mounted at right angles to the opposite end of said shank, in combination with a rod mounted rotatably through the axis of said handle and having knob affixed

to said rod externally of said handle, wherein the shank includes an eccentric slot extending from the first said end to the spur, said rod being rotatably mounted partially in said slot and projecting externally from said slot beyond the shank perimeter engaging rotatably said handle thereby keying the handle to the shank preventing relative rotation between said handle and said shank, said rod having a threaded end adjacent the said spur, in further combination with a longitudinally movable spur having a curved inner surface encompassing a longitudinal bore, said spur being mounted encompassingly on the shank and threaded end of said rod, a portion of said curved inner surface having threads coacting with the threaded end of said rod and the remainder of the curved inner surface slidingly engaging said shank, whereby rotation of said rod will cause the movable spur to move slidably longitudinally over the shank to vary the spacing from the fixed spur.

3,891,186

DEVICE FOR INSERTING DRAINS INTO THE GROUND

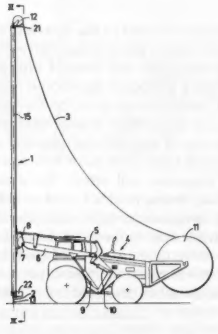
Sven Torgny Thorsell, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Nov. 26, 1973, Ser. No. 419,005

Claims priority, application Sweden, Nov. 27, 1972, 15426/72

Int. Cl. E21b *19/00*

U.S. Cl. 254—29 R **1 Claim**



1. In the known type of device for inserting flexible drain members downwardly into the earth and which includes

a. an earth penetrating tube that is adapted to annularly surround and protect a flexible drain member as the tube penetrates downwardly into the earth,

b. mast means which is designed to initially position said earth penetrating tube vertically above the earth,

c. means to move said earth penetrating tube from its initial vertical position downwardly with respect to said mast so that said tube and the drain member it protects will penetrate into the earth,

the improvement which comprises

1. said mast means comprising two rectangular tubes that are rigidly spaced apart from each other by rigid interconnecting means which thereby form an interior rectangular channel for the downward passage of said earth penetrating tube,

2. said means for moving said penetrating tube downwardly comprises two spaced apart roller chains each of which loops around one of said two rectangular tubes forming the mast means,

3. spaced apart ears adjacent the upper portion of said earth penetrating tube engaged by said spaced apart roller chains,

4. said spaced apart roller chains each being operatively connected to a motor means which is located adjacent the lower end of said mast means and

5. attachment means on said mast means for readily attaching and detaching said mast means to a suitable carrier vehicle.

3,891,187

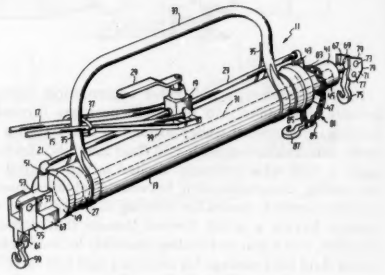
PORTABLE RESCUE DEVICE

Richard D. Bearden, Jr., 8817 Granby St., Norfolk, Va. 23503

Filed Oct. 19, 1973, Ser. No. 407,850

Int. Cl. B66f *11/04;* **A62b** *3/00;* **B21d** *1/12*

U.S. Cl. 254—93 R **10 Claims**



1. A portable rescue device of the type which is activated by a pressurized fluid received from a fluid source, said device comprising:

an elongated cylinder having basically closed first and second ends, but with first and second fluid transfer openings located respectively at said first and second ends, and an axially located piston-rod opening located at said first end;

a piston means mounted inside said elongated cylinder and being movable along said elongated cylinder by pressure differentials inside said elongated cylinder;

a piston rod attached to said piston means, said piston rod having an attachment end portion extending through said axially located piston-rod opening at said first end to outside said elongated cylinder;

a fluid activating system comprising a control valve for receiving fluid of positive pressure from said fluid source and applying said positively pressurized fluid selectively to said respective first and second fluid transfer openings thereby causing pressure differentials across said piston to move said piston along with said attached piston rod, in selective directions along said cylinder;

a cylinder swivel block attached at one end thereof, to said second end of said cylinder, said cylinder swivel block having freedom of movement to rotate in a plane in which the axis of the elongated cylinder lies so that it can selectively be in a position generally aligned with said axis or in a position skew to said axis, with a second end of said cylinder swivel block extending beyond the side of the cylinder when it is in said position skew to said axis; and

a cylinder tether-attaching means for selectively attaching and releasing a tether to and from said second end of said cylinder swivel block, said cylinder tether-attaching means having freedom of movement to rotate in the same plane of rotation as said cylinder swivel block so that said cylinder tether-attaching means can extend away from said cylinder swivel block in a first direction generally aligned with said elongated-cylinder axis when said cylinder swivel block is in a position aligned with said elongated-cylinder axis and in a substantially opposite direction

along said cylinder when said cylinder swivel block is in a position skew to said axis;

wherein, said elongated cylinder includes a supporting means which, when said cylinder swivel block is in a position skew to said axis, supports said cylinder swivel block against further rotation and wherein a surface of said cylinder swivel block which faces away from said cylinder when said cylinder swivel block is in said position skew to said axis forms a relatively flat bearing surface which is approximately perpendicular to said cylinder axis.

3,891,188

TOOL FOR PULLING A LINE THROUGH A CONDUIT

Benjamin F. Peirce, Jr., 1040 S.W. 67th Ter., Plantation, Fla. 33317

Filed Feb. 25, 1974, Ser. No. 445,631
Int. Cl.[2] E21C *29/16*
U.S. Cl. 254—134.3 R **2 Claims**

1. A tool for pulling a line through a conduit comprising an elongated wire having a long flexible shank, handle means at one end of said shank to be grasped manually by a person, and hook means at the other end of said shank comprising a first bight curving outward from said shank substantially in the plane of said shank through a turn of approximately 90°, and a second bight curving from said first bight through a turn of at least 90° and at a slight inclination back toward said one end of the shank in a plane approximately at 90° to said first named plane, said second bight terminating in a tip disposed toward said one end of the shank from said first bight, said tip having a tapered edge which merges smoothly with the outside circumference of said second bight and makes a distinct corner with the inside circumference of said second bight.

3,891,189

LINK CHAIN SUPPORT POST

Michael T. Russo, 1805 Larchwood St., Bloomfield Hills, Mich. 48084

Filed Jan. 28, 1974, Ser. No. 437,427
Int. Cl. E04h *17/00*
U.S. Cl. 256—1 **7 Claims**

1. A vertically elongated plastic post comprising:

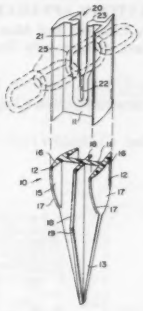
an H-shaped in cross-section body portion formed of a substantially flat web and opposite side flanges integrally joined together to form the H-shape;

with the lower end of the web being extended a distance beneath the lower end of the flanges to form a downwardly pointed spike portion on the lower end of the post;

a central flange formed on each of the opposite faces of the web and extending from the lower point of the web upwardly and centrally between and parallel to the side flanges;

the lower ends of the side flanges terminating at the upper end of the extension of the web, and

a vertically elongated, central opening slot formed in the upper end of the web, and centrally between the side flanges, the slot being formed with an elongated upper



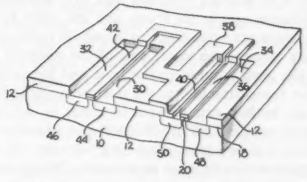
portion and an elongated narrower lower portion; and the web portion defining the edges of the slot being slightly springy; the slot portion widths being of a size for the slot portions each to snugly receive and frictionally grip a single chain link arranged in the vertical plane, with the lower slot portion sized to receive a smaller link than the upper slot portion.

3,891,190

INTEGRATED CIRCUIT STRUCTURE AND METHOD FOR MAKING INTEGRATED CIRCUIT STRUCTURE

Leslie L. Vadasz, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 269,735, July 7, 1972, abandoned, which is a division of Ser. No. 101,805, Dec. 28, 1970, Pat. No. 3,699,646. This application Feb. 15, 1974, Ser. No. 443,010
Int. Cl. H01l *11/00*
U.S. Cl. 357—41 **3 Claims**



1. An integrated circuit which includes a plurality of gate type devices wherein each such device includes a separated source and drain in a semiconductor body and a gate spaced insulatively above and between the source and drain, the improvement comprises:

a silicon contact member to provide electrical coupling to one of said source and drain in a first gate type device, said silicon contact member being contiguous to said semiconductor body at one of said source and drain in said first gate type device;

a silicon gate member to form said gate insulatively spaced above and between the source and drain of a second gate type device; and

a silicon interconnect member to provide electrical coupling between said silicon gate member and said silicon contact member, said interconnect member being inte-

grated with and contiguous to said contact and gate members,

whereby one of said source and drain of said first gate type device is electrically coupled to said gate of said second gate type device and high density circuits achieved.

3,891,191
VIBRATORY APPARATUS

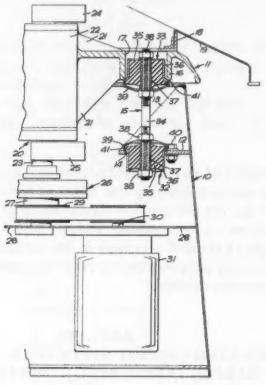
Marcel Henry Choules, London, and Alan William Hare, Ashford, both of England, assignors to Russell Finex Limited, London, England

Filed May 7, 1973, Ser. No. 357,644

Claims priority, application United Kingdom, May 18, 1972, 23522/72

Int. Cl. B01f *11/00*

U.S. Cl. 259—1 R **7 Claims**



1. A vibratory apparatus comprising a base, a vibratory frame superimposed on the base, and means for mounting the frame on the base for vibration with respect thereto, which means is provided by a plurality of mounting devices each located between the frame and the base, and comprising a pair of opposed elastomeric bushes which are spaced from one another at a substantial distance and are secured by their outer peripheries one to the frame and the other to the base, an elongate member extending in a generally vertical direction between the bushes, the lower end of the member being attached to the bush secured to the base and the upper end of the member being attached to the bush secured to the frame, whereby the bushes can deform in shear to accommodate large vertical components of vibration and whereby the elongate member acts as a lever extending between the bushes to permit the absorption of large movement of the frame relative to the base with the bushes being subjected to only relatively small deflections, each bushing having a bore in which the respective end of the corresponding member is secured and the bore of the bushing being of uniform cross-section and being bonded to a cylindrical sleeve, the elongate member passing through and being secured in the sleeve.

3,891,192
PRE-MIXER FOR ALIMENTARY PASTE

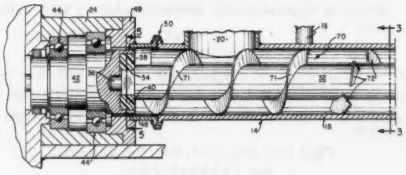
Ignatius Bontempi, Douglaston, and Peter Giemisch, Central Islip, both of N.Y., assignors to De Francisci Machine Corporation, Brooklyn, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,724

Int. Cl.[2] B01F *7/08*

U.S. Cl. 259—110 **5 Claims**

1. Apparatus for pre-mixing alimentary paste ingredients comprising: a longitudinally extending, unitary housing having first and second ends; a longitudinally extending shaft having first and second ends being positioned within said housing; a motor; means for connecting the output of said motor to said shaft first end including a rectangular projection being formed on said shaft first end, a cylindrical bushing having a rectangular keyway formed therein, said bushing being positioned directly adjacent said shaft first end; means for supporting said shaft second end for rotational movement; said unitary shaft extending at least as far as said shaft second end supporting



means, a first paddle being formed on said shaft adjacent said shaft first end, said first paddle being the shape of a solid helical plane generated about the outer surface of said shaft, said first paddle being inclined so as to induce flow toward said shaft second end, a plurality of second paddles being formed on said shaft, said second paddles comprising helical segments spaced about the outer surface of said shaft, said second paddles being inclined so as to induce flow toward said shaft second end.

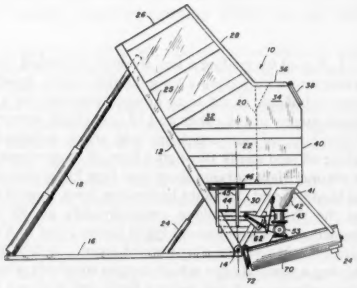
3,891,193
MOBILE APPARATUS TO MIX AND DELIVER CONCRETE COMPOSITIONS OR THE LIKE

L. F. Perry, Jr., Georgetown, Tex., assignor to Century Industries, Inc., Georgetown, Tex.

Filed Mar. 4, 1974, Ser. No. 447,650

Int. Cl. B28c *7/04*

U.S. Cl. 259—165 **10 Claims**



1. A mobile storage and delivery system for a plurality of dry fluent particulate materials, comprising:

a. a mobile frame

b. a body mounted on said frame and hinged at the rearward end of said frame and means to lift and rotate said body through a selected angle;

c. said body including two tanks, a large tank resting on said frame and a small tank resting on said large tank, such that when said body is lifted and rotated through said selected angle, the common wall between said two tanks will be substantially vertical with the small tank rearward of said large tank;

d. the bottom ends of both tanks in the raised position comprising hoppers, adapted to feed fluent material from the bottoms of said tanks;

e. first flow metering means comprising horizontal belt means below the hopper of said large tank, the belt sur-

face moving rearwardly and overhanging the forward end of a mixing and delivery means and including means to control the level of fluent material carried on said belt;

f. second flow metering means controlling the flow of fluent material from said small tank and delivering said material from said small tank into said mixing and delivery means; and wherein

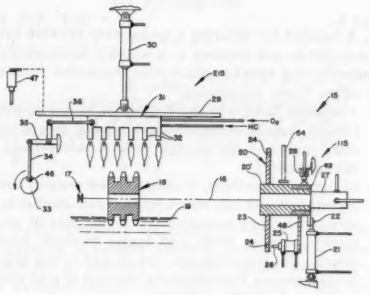
g. said first and second metering means are driven in fixed speed relation.

3,891,194

FLAME HARDENER

James David Carrigan, Odessa, Tex., assignor to Vance Industries, Inc., Odessa, Tex.

Filed Oct. 15, 1973, Ser. No. 406,141
Int. Cl. C21d *9/32*
U.S. Cl. 266—4 A **8 Claims**



1. Flame hardening apparatus for tempering gear teeth comprising:

quench means for rapidly cooling a gear tooth to a temperature which avoids the formation of decomposition products; a heat source for raising the temperature of a gear tooth to a temperature which promotes the formation of an austenitic structure;

mount means for rotatably supporting a gear wherein the gear has circumferentially spaced gear teeth thereon which are to be simultaneously placed in heat transfer relationship with said quench means and said heat source; said heat source and said quench means being circumferentially spaced about said mount means so that the teeth of a gear supported by said mount means has one tooth thereof in heat transfer contact relationship with said heat source, another tooth thereof in heat transfer contact relationship with said quench means, and with there being a plurality of teeth located between said one tooth and said another tooth;

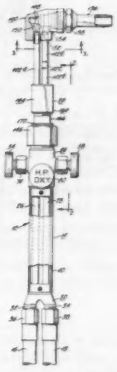
means for rotating said mount means an amount which moves the one gear tooth directly from the heat source to the quench means; said means for rotating said mount means includes an index means, said index means being connected to cause a gear supported on said mount means to be rotated an amount equal to the circumferential distance about the gear measured from said heat source to said quench means so that each and every time the index means causes a gear to be rotated a tooth of the gear is moved directly from the heat source to the quench means; said index means further providing that all of the individual gear teeth are subjected to the action of the heat source and quench means a single time before any one tooth can be subjected to the action of the heat source and quench means a second time.

3,891,195

CUTTING-WELDING TORCH

Justin W. Mills, Jr., Cinnaminson, N.J., and Mark H. Betzler, Wilkes-Barre, Pa., assignors to Lif-O-Gen, Inc., Cambridge, Md.

Filed May 14, 1974, Ser. No. 469,842
Int. Cl. B23k *7/02*
U.S. Cl. 266—23 P **4 Claims**



1. A cutting-welding torch comprising a handle assembly, a gaseous fuel needle valve in said handle assembly, means for connecting a source of gaseous fuel under pressure with said fuel needle valve, an oxygen needle valve in said handle assembly, means for connecting a pressurized source of oxygen with said oxygen needle valve, a high pressure oxygen valve in said handle assembly, means for connecting said high pressure oxygen valve with said pressurized source of oxygen, a cutting tip adapted for demountable attachment to said handle assembly, said cutting tip comprising a mixing head, means for connecting said mixing head with each of said fuel and oxygen needle valves and said high pressure oxygen valve, a welding tip adapted for demountable attachment to said handle assembly, said welding tip including a mixer, connecting means for connecting said fuel and oxygen needle valves to said mixer, and means in said welding tip for blocking flow from said high pressure oxygen valve when said welding tip is attached to said handle assembly.

3,891,196

APPARATUS FOR TREATING A MELT

Eckehard Förster; Helmut Richter; Edgar Spetzler; Jochen Wendorff, all of Oberhausen; Wilhelm Klapdar, Essen, and Heinrich-Wilhelm Rommerswinkel, Mulheim-Ruhr, all of Germany, assignors to Thyssen Niederrhein AG Hutten- und Walzwerke, Oberhausen, Germany

Filed Jan. 21, 1974, Ser. No. 435,096
Int. Cl. C21c *7/00*
U.S. Cl. 266—34 T **6 Claims**

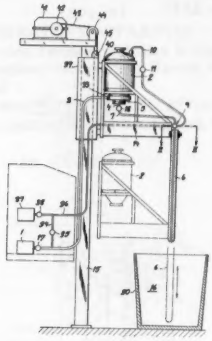
1. An apparatus for introducing particulate solids into a molten-metal melt, comprising:

a supply vessel receiving solid particles and formed at its bottom with a suspending device for forming a solid/gas suspension, means for admitting a carrier gas into said suspending device, and an outlet at said suspending device for discharging said suspension from said vessel;

a lance immersibly in said bath;

a suspension-feed line connecting said outlet with said lance;

a mixing chamber along said feed line for admitting a pressure gas to the suspension stream traversing said feed line; and



a bypass duct provided with a control valve connecting the top of said vessel with said mixing chamber, said mixing chamber comprising a cylindrical housing spacedly surrounding said feed line, said bypass duct opening tangentially into said housing and said feed line being provided within said housing with at least one carrier gas opening.

3,891,197

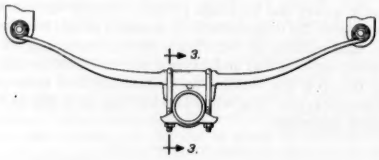
SINGLE LEAF SPRING

Gus L. Poulos, Rt. 1, Winamac, Ind. 46996

Filed Oct. 15, 1973, Ser. No. 406,572

Int. Cl. B60q *11/10*

U.S. Cl. 267—47 **5 Claims**



1. A single leaf spring used in conjunction with a pair of shackle means and an axle, said spriing comprising a central portion and two elongated end portions extending integrally outwardly from opposite ends of said central portion, said central portion having a thickened cross section exceeding the thickness of the cross sections of said end portions, said central portion having first and second oppositely located side faces extending between said ends thereof, said first side face supporting said axle in a transverse relationship, said second face having a pair of spaced grooves formed therein, said grooves extending transversely across said second face, a pair of U-bolt means, each bolt means including generally parallel legs interconnected at corresponding ends by an intermediate part, each bolt means having its legs straddling said spring central portion with the intermediate part thereof fitting lockingly in a said groove, means engaging each bolt means at the legs thereof securing said axle to said spring at said spring central portion.

3,891,198

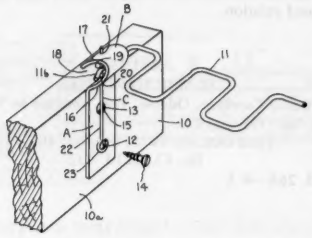
FURNITURE UPHOLSTERY SPRING SECURING BRACKET

Kenneth G. Bible, 201 Butler Dr., Greenville, S.C. 29611

Filed Sept. 23, 1974, Ser. No. 508,189

Int. Cl.[2] F16F *3/02*

U.S. Cl. 267—110 **3 Claims**



1. A bracket for securing a spring strip beneath upper upholstery fabric and padding to a wooden furniture frame rail member having interior side surface accessible from the bottom of the frame comprising:

a. a straight flat lower shank portion having spaced holes formed therein for receiving fastening means mounting said bracket to the interior vertical side surface of said rail member;

b. an upper substantially U-shaped hook portion having one leg integral with said shank portion and another leg thereabove extending substantially on one side of said shank portion remote from said frame member forming an opening for receiving one end of said spring strip; and

c. locking means for containing one end of said spring strip received in said hook portion;

whereby said bracket can be easily attached to said interior vertical side surface from the bottom of said furniture frame without removing the upper fabric and padding therefrom for securing said spring strip across the frame member.

3,891,199

HYDRAULIC SHOCK ABSORBER

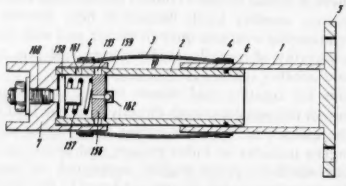
Jean Herbert Willich, and Christian Pfeil, both of Ennepetal, Germany, assignors to Firma August Bilstein, Ennepetal-Altenvoerde, Germany

Filed Sept. 21, 1972, Ser. No. 290,854

Claims priority, application Germany, Aug. 2, 1972, 2237914

Int. Cl. F16f *9/08, 9/342*

U.S. Cl. 267—139 **9 Claims**



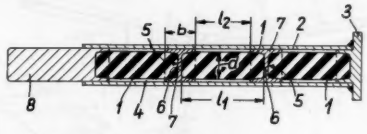
1. A hydraulic shock absorber comprising two telescopically engageable tubes containing damping liquid, a resilient bag disposed exteriorly of said tubes and attached to spaced-apart portions of said tubes in fluid-sealing engagement and encircling outer peripheral portions of said tubes interposed the points of bag attachment to said tubes so as to define a damping liquid storage chamber therewith, said storage chamber communicating with said damping liquid in said tubes by

means of a throttling port whereby said damping liquid is received in said storage chamber during telescopic movement of one of said tubes into the other in the course of a tube compression stroke, and means for adjusting the effective fluid-conveying cross-section of the throttling port disposed adjacent said throttling port and extending sealingly from the interior of one of said tubes so as to be engageable exteriorly of said shock absorber; said resilient bag acting to return said damping fluid to said tubes through said throttling port and to return said tubes to the extended condition following said compression stroke.

3,891,200
BUFFER STRUCTURE

Wilhelm Schwarz, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 12, 1974, Ser. No. 450,309
Claims priority, application Germany, Mar. 17, 1973, 2313389
Int. Cl. F16f *7/08*
U.S. Cl. 267—140 **4 Claims**



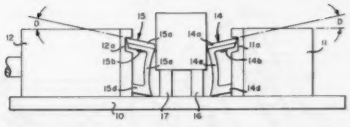
1. A buffer structure for relatively large buffer strokes, which includes: a tubular member having hollow chamber space therein, a plurality of buffer bodies including ends thereof arranged axially one behind the other in said tubular member, said buffer bodies comprising cellular elastic material and when under no load having a radial play with regard to the inner surface of said tubular member so as to be able to radially expand when being subjected to an axial load, closure means including hollow space therewith connected to and closing one end of said tubular member, a plurality of intermediate elements slidably arranged within said tubular member and respectively interposed between each two adjacent ones of said buffer bodies, the other end of said tubular member being open, and push rod means with hollow space at an end thereof slidably guided by said open end of said tubular member and adapted to engage the respective adjacent end portion of the respective adjacent buffer body for elastically compressing the latter and the other buffer bodies in said tubular member in response to an axial load acting upon said push rod means in the direction toward said closure means, said intermediate elements comprising discs with annular flange means slidably engaging the inner wall surface of said tubular member, said ends of the buffer bodies being inserted in the hollow chamber space formed by the discs and flange means as well as in the hollow space of the closure means on one end of said tubular member and into hollow space of the end of said push rod means extending into said tubular member, said annular flange means extending on opposite sides of the pertaining discs.

3,891,201
COMPRESSION HOLD-DOWN ELEMENTS

Robert G. Clugage, P.O. Box 5021, Incline Village, Nev. 89450

Continuation-in-part of Ser. No. 273,971, July 21, 1972, Pat. No. 3,791,640. This application Jan. 16, 1974, Ser. No. 433,898The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.
Int. Cl. B23q *3/06*
U.S. Cl. 269—136 **2 Claims**

1. A compression hold-down and clamping device for holding a work-piece down upon supporting means interposed between the jaws of the clamping device, the combination comprising a hold-down element having an elongated top member, said top member having a rounded forward surface for engaging the workpiece, an elongated bottom member, the forward parts of said members being joined by a web, a clamping device comprising a pair of jaws and means to move one jaw toward the other to effect a clamping action, the jaws of the clamping device each having a horizontally extending recess for receiving the rear part of said top member to pre-

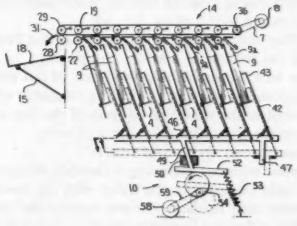


vent said top member from slipping when pressure is applied thereto, said bottom member engaging said jaw of the clamping device near the bottom of said jaw, said top member being tilted at a predetermined angle with respect to the side of the workpiece engaged thereby, said predetermined angle is slightly reduced when pressure is applied to said top member and said rear parts of said top member and said bottom member are moved away from each other as said web is flexed whereby the workpipece is pressed down on the supporting means.

3,891,202
COLLATING MACHINE

Melvin D. Kircher, 449 Jefferson St., Lansdale, Pa. 19446

Filed May 1, 1972, Ser. No. 248,828
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 **13 Claims**



1. A machine for collating sheet material into desired order from individual stacks, including:
   a. a plurality of storage compartments disposed at an angle to the vertical for storing individual stacks of sheet material, and
   b. feed means for simultaneously separating the outer sheet of each stack in each storage compartment whereby said sheets can be collected into individual sets of properly ordered sheet material,
   c. said feed means comprising a push member extending upwardly within each compartment and which includes a frictional device which rests on the top sheet of the stack contained therein, said push member having an end pivotally attached to an elongated carrier member which is part of a rigid single unit assembly comprising:
      1. a follower arm positioned below and parallel to the said carrier member,
      2. an extension which rigidly joins said carrier member and said follower arm, and
      3. guide means which slidingly engage said extension to constrain said extension to move at a constant angle essentially parallel to the angle of the storage compartments,

said assembly being driven up and down by drive means operatively connected to said follower arm.

3,891,203

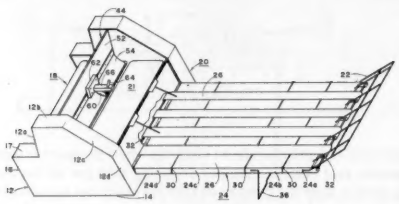
OFFICE MACHINE INCLUDING FLAT ARTICLE FEEDER

Joseph Schiff, 5 Lipski St., Tel Aviv, Israel

Filed Dec. 27, 1973, Ser. No. 428,867

Int. Cl. B65h *29/16, 5/06*

U.S. Cl. 271—4 **14 Claims**



1. An office machine comprising a machine casing, means within the casing for processing a plurality of flat articles, an input feeder feeding the flat articles from a supply station at the input side of the casing to a processing station within the casing, and an output feeder at the output side of the casing for feeding the articles away from the processing station, at least one of said feeders comprising a conveyor belt and a conveyor platform supporting the belt, said conveyor platform including a plurality of hinged sections permitting the platform and the conveyor belt supported thereby to be disposed in either an extended operating position wherein the hinged platform sections are extended for conveying the flat articles, or in a folded non-operating position wherein the hinged platform sections are folded to conform to the configuration of the machine casing and the conveyor belt disposed within the machine casing.

11. An office machine including a feeder for feeding flat articles from the bottom of a stack, comprising:

a rotatable web for supporting the stack of flat articles;

a roller disposed in alignment with the rotatable web at the end thereof in the direction of feed of the flat articles;

drive means for rotating said roller and web;

a rigid plate spaced above said roller;

and a stripper member including a flexible strip supported by said rigid plate above the roller with the lower end of the flexible strip resiliently urged against the upper surface of the roller and bowed in the direction of feed of the flat articles;

said roller, flexible strip and rigid plate being of a width at least equal to the width of the flat articles to be fed, the surface friction of the roller being greater than that of the lower free end of the flexible strip;

whereby the machine may be continuously loaded without adjusting for the width, length or thickness of the flat articles, the flat articles being fed one at a time from the bottom of the stack and being maintained in a stack by the rotation of the web without the need for rear or side walls.

3,891,204

TRANSFER MECHANISM FOR SHEET MATERIAL

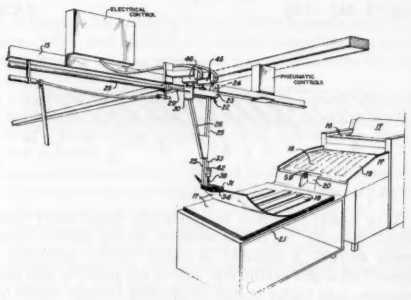
Julian Mager, Baltimore, Md., assignor to The Londontown Manufacturing Co., Baltimore, Md.

Filed Dec. 27, 1973, Ser. No. 428,729

Int. Cl. B65h *29/10*

U.S. Cl. 271—85 **3 Claims**

1. A sheet material linear transfer and stacking apparatus comprising an overhead guide and support track positioned at an elevation well above the heads of workers on a factory floor or the like, a carriage mounted on said track and movable in opposite directions thereon toward and away from a source of sheets requiring transfering and stacking at a new location spaced from the source, a depending substantially vertical arm structure secured to the carriage and movable therewith along said track, a sheet gripping means carried by the lower end of the arm structure at an elevation to engage sheets at said source and transfer them to said new location, said sheet gripping means comprising a relatively stationary upper jaw fixedly secured to the arm structure substantially at right angles thereto and projecting forwardly thereof, and a lower cooperating vertically swingable jaw below the fixed jaw and pivotally secured to the arm structure, a first fluid-pressure operated cylinder unit on the arm structure having a connection with said vertically swingable lower jaw to shift the latter between open and closed positions with relation to the upper fixed jaw, a second fluid-pressure operated cylinder unit mounted adjacent to and lengthwise of said overhead track and having a connection with said carriage to reciprocate the carriage on the track, a pair of solenoid valves operatively



connected with said first and second named cylinder units to cyclically control the operation thereof, a pair of electrical limit switches on said overhead track and spaced apart longitudinally of the track and both having actuators in the path of movement of the carriage, said limit switches electrically connected with said solenoid valves in such a way that engagement of said carriage with the actuator of one limit switch while moving in one direction causes opening movement of said lower jaw by the first-named cylinder unit followed by a reversal of the direction of movement of said carriage on said track by the second cylinder unit in response to engagement of the carriage with the actuator of the second limit switch, and another switch mounted adjacent said source of sheets and electrically coupled with said solenoid valves in such a way that successive actuations of the last-named switch by successive sheets at said source produces closing of the lower jaw by the first cylinder unit and gripping of each sheet and substantially simultaneous retraction of said carriage from said source and toward said new location by said second cylinder unit.

3,891,205

METHOD FOR PAPER FEEDING AND DEVICE THEREFOR

Hiroshi Sunahara, Seto, and Yoshio Kimura, Kyoto, both of Japan, assignors to Agency of Industrial Science & Technology, Japan

Filed Nov. 14, 1973, Ser. No. 415,800

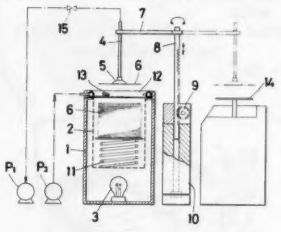
Claims priority, application Japan, Nov. 15, 1972, 47-114440

Int. Cl. B65h *3/08, 3/48*

U.S. Cl. 271—98 **5 Claims**

1. A method for feeding paper stacked within a magazine comprising:

disposing a support means above said paper magazine;
moving said support means vertically downwardly by a reciprocable drive means;
causing the uppermost sheet of paper of said paper stack stored in said magazine to be drawn vertically upwardly onto a sucker, supported upon said support means, by virtue of vacuum produced therein by a suction pump;
moving said support means and said sheet of paper vertically upwardly so as to remove said sheet of paper from said paper stack for transferring the same;
blowing air toward said sheet of paper in a peripheral manner from a fixed position disposed above said magazine as said support means and said sheet of paper passes said position during said vertical movement of said support means and said sheet of paper for thereby blowing down any extra sheets of paper entrained by said uppermost sheet held in direct contact with said sucker;
transferring said support means and said uppermost sheet of paper held fast on said sucker to a required position;
returning said support means to said position disposed above said magazine; and

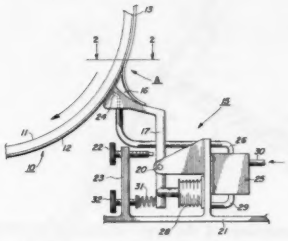


repeating said method until said stack of paper is depleted.

4. A device for feeding paper comprising in combination:
a magazine for storing a stack of paper;
a sucker disposed upon elongated support means and above said stack of paper, adapted to draw the uppermost sheet of paper of said paper stack vertically upwardly from said stack in said magazine as a result of vacuum produced within said sucker by means of a suction pump;
driving means for imparting vertical reciprocable motion to said elongated support means and said sucker sufficient to permit said support means and said sucker to reach the lowermost sheet of paper of said stack as well as to clear the upper portion of said magazine, and rotary motion when said sucker is clear of said magazine, as required; and
means fixedly disposed peripherally about and above said magazine for directing a forced current of air toward said uppermost sheet of paper drawn fast against said sucker thereby causing any extra sheets of paper entrained by said uppermost sheet to be blown down onto said stack of paper.

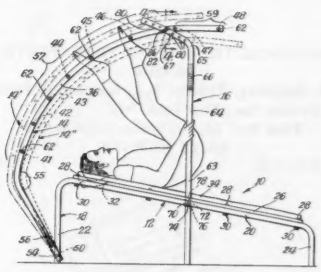
3,891,206
SHEET STRIPPING APPARATUS
Ari Bar-On, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed July 2, 1973, Ser. No. 375,392
Int. Cl. B65h *29/56*
U.S. Cl. 271—174 **5 Claims**

1. Apparatus for removing a sheet of final support material from a moving photosensitive surface including:
sheet stripping means having a stripper element adapted to move between the support material and the moving photosensitive surface and a lever arm for movably supporting said stripper element adjacent to but spaced from the moving photosensitive surface,
said stripper element having an air passageway formed therein terminating in a port adjacent said photosensitive surface, said passageway being provided with a source of air, variation in the distance between said port and said photosensitive surface causing a variation in the air pressure within the passage in said stripper element,
means to movably support said lever arm whereby said stripper element is positionable relative to said moving photosensitive surface,



pneumatic means operatively connected to said lever arm for positioning said arm whereby said stripper element is supported in a predetermined position adjacent to but spaced from said moving photosensitive surface, and
control means operatively connected to said air passageway for actuating said pneumatic means in response to the pressure in said passageway whereby said lever arm is maintained in said predetermined position.

3,891,207
EXERCISER DEVICE
Merle M. Helliwell, Winchester, Ill. 62694
Filed Jan. 11, 1974, Ser. No. 432,668
Int. Cl. A63b *17/00*
U.S. Cl. 272—58 **9 Claims**



1. An exerciser device particularly useful in exercising the back and legs of a person, said exerciser device comprising a back support member upon which the person may lie, said back support member having a head end and an opposite end, a curved ladder member having one end attached to the head end of said back support member, said ladder member rising above said back support member and over the top of said back support member and curving toward the opposite end of said back support member, the other end of said ladder member terminating above said back support member, said ladder member having a plurality of spaced rungs for engagement by the feet of the person, and support means for supporting said other end of said ladder member, said support means being secured to said back support member and extending generally upwardly and being detachably connected to the other end of said ladder member.

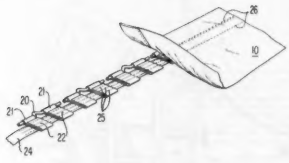
3,891,208
CONCEALED SPRING ANCHORING MEANS FOR TRAMPOLINES AND METHOD OF PRODUCING SAME

Bruce C. Sidlinger, 208-214 International Rd., Garland, Tex. 75040

Continuation-in-part of Ser. No. 201,376, Nov. 23, 1971, Pat. No. 3,767,009. This application June 18, 1973, Ser. No. 370,681

Int. Cl.[2] A63B *5/18*

U.S. Cl. 272—65 **18 Claims**



4. In a trampoline of the type wherein a flexible bed is supported by an encircling frame by means of a series of coil spring means connected in stressed condition between a series of short tapes secured at spaced intervals along the marginal areas of the bed and said frame, the improvement which consists of a plurality of first securing means respectively connecting each of said short tapes only to an elongated second tape extending along a margin of the bed, and second securing means to attach the second tape extending along the marginal area of the trampoline bed on the underside thereof and thereby to cover and protect said first securing means from exposure to forces acting from above said trampoline bed whereby a failure of the second securing means at a given location will not result in the complete loss of spring support at that location.

9. Method of attaching spring anchors to the margin of a trampoline bed comprising the steps of preparing a length of flexible tape to receive a plurality of metal anchors at spaced locations along the length of the tape, and securing said prepared tape to said trampoline bed adjacent a margin thereof.

3,891,209
PSYCHOLOGICAL TESTING AND THERAPEUTIC GAME DEVICE

Nathan I. Kritzberg, Tenafly, N.J., assignor to Psychotherapeutic Devices, Inc., New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,683

Int. Cl. A63f *9/00*

U.S. Cl. 273—1 R **10 Claims**

24
You Get Too Good Sitting In The Cool Mood Like A Stone About Do Upon Then Love Do For Ideal
Do Heaven Work Fear
Dear Better Love
Dog Human Heart
Gate Live Dirt

1. A psychological testing and therapeutic game device adapted to be employed to evoke fantasizing for purposes that include psychological testing and therapy comprising:

a first set of cards, each having a first indicia thereon and each card of said first set containing a set of words,

a second set of cards, each having a second indicia and each card of said second set containing a set of words,

a spinner board having a spinable pointer and a plurality of zones, said pointer when at rest designating one of said zones,

a first set of said zones, each having a first indicia thereon corresponding to said first indicia on said first set of cards,

a second set of said zones, each having a second indicia thereon corresponding to said second indicia on said second set of cards,

the predominant portions of the words on said cards of said first and second sets of cards each tending to evoke a significant primary emotion,

said words comprising a plurality of subsets of words, each of the words in any one of said subsets tending to evoke the same primary emotion,

each of said cards in said first set of cards containing at least one word tending to evoke a significant primary emotion, all of said evoking words on any one of said cards of said first set of cards belonging to only one of said subsets,

each of said cards of said second set of cards containing at least one word from each of the sub-sets represented by said first set of cards.

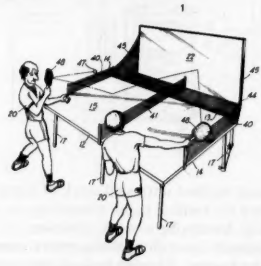
3,891,210
DEFLECTOR BALL GAME APPARATUS

William J. Van Horne, P.O. Box 39113 Bolton Station, Atlanta, Ga. 30318

Filed Aug. 8, 1973, Ser. No. 386,531

Int. Cl. A63b *67/04*

U.S. Cl. 273—30 **3 Claims**



2. Deflector ball game apparatus comprising a table having a substantially flat top surface, front, rear and side edges, said table providing a playing court of sufficient length to enable two players to stand side by side adjacent said front edge of said table; a deflector board mounted substantially parallel, behind and in spaced relation with said rear edge of said table in a generally upright position; a pair of side barriers mounted uprightly along at least a portion of said edges of said table; a net mounted uprightly over the center of said table substantially parallel and between said side barriers with an end thereof jutting over said rear edge of said table into abutment with said deflector board.

3,891,211
TENNIS RACKET WITH INTERCHANGEABLE STRING FRAME

Peter C. Diefenbach, 65 South Main St., Southampton, N.Y. 11968

Filed June 13, 1974, Ser. No. 479,003

Int. Cl.[2] A63B *49/02*

U.S. Cl. 273—73 L **2 Claims**

1. A tennis racket comprising:

a first bow portion having a base at one end;

a handle including a throat portion and having said base of said first bow portion integrally formed on said throat portion;

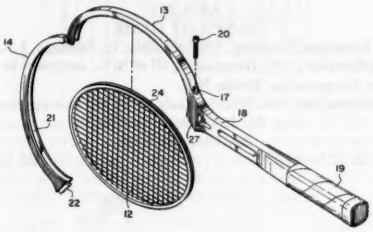
a second bow portion pivotally coupled to said first bow portion at another end thereof;

an annular and continuous groove formed on the inside periphery of said first and second bow portions;

a string frame removeably disposed in said groove;

said base having an arcuate inner periphery extending continuously with that of said first bow portion and abutting said string frame, said base having a lateral side formed with a straight inclined portion forming an acute angle with respect to the longitudinal axis of said handle, said inclined portion being formed with a central channel extending along its length;

said second bow portion having a free end formed with an inclined edge and having a central projecting flange extending therefrom along its length, said inclined edge and



said projecting flange complementary fitting together with said inclined portion and said central channel, respectively, of said base of said first bow portion in a closed position, said second bow portion having an arcuate inner periphery extending continuously from that of said base portion in said closed position and abutting said string frame, said base and said free end of said second bow portion being formed with a hole extending perpendicularly to the longitudinal axis of said handle and through said projecting flange with that portion of the hole in the second bow portion being threaded; and

a set screw disposed in said hole for releasably threadably coupling said base and said free end in said closed position.

3,891,212

PORTABLE KIT FOR ASSEMBLING GOLF CLUB

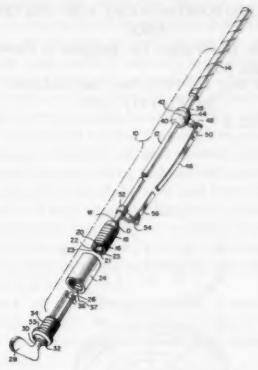
Johnnie P. Hill, 700 Maxfield, Waco, Tex. 76705

Filed Dec. 19, 1973, Ser. No. 426,012

Int. Cl. A63b *53/02*

U.S. Cl. 273—80.1 **10 Claims**

1. A portable kit for assembling a golf club for executing various golf strokes such as teeing off, chipping, putting, or the like, said kit comprising a shaft, a plurality of club heads or spoons any one of which may be assembled upon a lower end of said shaft, and a carrying case for said club heads or spoons, characterized in that said shaft comprises a handle or grip at its upper end, coupling means at the lower end thereof in the form of a tubular member with alternate splines and recesses therein and a threaded portion externally thereof and which in assembly cooperates with a club head or spoon member selected from said kit with a similarly threaded portion and spline elements extending from the end thereof and in said recesses of said tubular member and a sleeve with internal threads engaged with both said threaded portion of said tubu-



lar member and said threaded portion of said club head or spoon member.

3,891,213

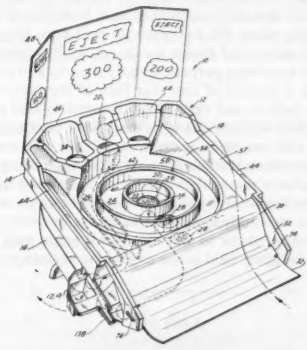
SKEE-BALL APPARATUS INCLUDING BALL EJECTION TARGETS

Julius Cooper, New Hyde Park, and Tormod K. Reinertsen, East Northport, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed July 9, 1973, Ser. No. 377,467The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.

Int. Cl. A63b *71/02*

U.S. Cl. 273—95 D **22 Claims**



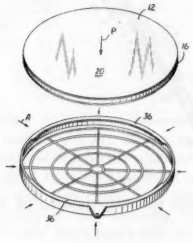
1. A game for use with a plurality of projectiles which are adapted to be rolled or otherwise projected into the game which comprises a frame having first and second sets of apertures formed therein, said sets respectively defining a plurality of independent projectile ejection and scoring openings and a plurality of independent actuator members mounted on said frame, said actuator members being respectively operatively and independently associated between individual apertures in said first and second sets; and each independent actuator including stop means for preventing a projectile from passing through its associated scoring opening and associated means for removing only its associated stop means from its associated scoring opening in response to the projection of a projectile into the associated ejection opening, thereby to permit a

projectile to fall through said scoring opening, without affecting the stop means of any other actuator in the game.

3,891,214
HEAT SHRINKING DARTBOARD CAGE AND ONE PIECE CORE

Francis E. Scullin, Havertown, Pa., assignor to Crown Recreation, Inc., Hollis, N.Y.

Filed Dec. 10, 1973, Ser. No. 424,336
Int. Cl. F41j *3/00*
U.S. Cl. 273—102 B **14 Claims**



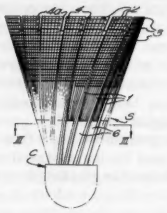
1. A dartboard comprising a target core having a front target face, a peripheral side wall, and a rear face; and a one-piece cage operatively secured to said core, said cage including a plurality of integrally formed operatively interconnected ribs located in a common plane and superimposed on at least a portion of said front face of the core to define therebetween a plurality of target areas on said front target face, a peripheral rim integrally connected to at least one of said ribs and extending about the periphery of said core perpendicularly to said plane, and flange means integrally connected to said rim and extending perpendicularly thereto and extending over at least a portion of said rear face of the core whereby said core is held in and operatively secured to said cage between said bars and said flange means; said core comprising a relatively stiff one-piece member; said cage and core being generally complementary in plan, and said cage being formed of a thermoplastic material having the characteristic of shrinking upon cooling whereby said one-piece relatively stiff core is adapted to be readily inserted in said cage between said ribs and said flange means as one flat piece when said cage is formed and is tightly held in the cage upon shrinkage thereof.

3,891,215
SHUTTLECOCKS

Ian Christy Maconachie, Sandwich, England, assignor to Reinforced Shuttlecocks Limited, London, England

Continuation-in-part of Ser. No. 458,012, April 4, 1974, abandoned. This application Oct. 29, 1974, Ser. No. 518,886
Claims priority, application United Kingdom, Apr. 5, 1973, 16351/73
Int. Cl. A63b *67/18*
U.S. Cl. 273—106 A **14 Claims**

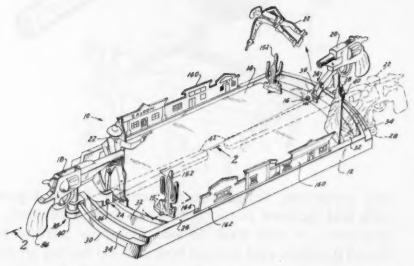
1. A shuttlecock having a base and a frusto-conical skirt extending from said base, in which said skirt, which is formed of plastics material, comprises a truncated conical lattice structure made up of longitudinal main stems and subsidiary stems joined by transverse ribs, wherein said skirt is provided at its wide end with slits which extend from the wide end generally towards the base, said slits being at least three times as long in the longitudinal direction of the shuttlecock as they are wide, and having a width no greater than 1/5th the distance between main stems at the wide end of said skirt, there being only one slit between any adjacent pair of main stems.



3,891,216
GUNFIGHT GAME

Burt Ensmann, Flushing; Michael Ieda, Ft. Solanga, L.I., and Madhusdan Joshi, Hempstead, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Division of Ser. No. 376,990, July 6, 1973. This application Aug. 21, 1974, Ser. No. 499,385
Int. Cl. A63f *9/02*
U.S. Cl. 273—119 R **22 Claims**



1. A game comprising a frame having a playing surface formed thereon and at least two toy guns operatively associated with said frame for movement with respect thereto, said guns each including a housing, means in said housing for discharging a projectile onto said playing surface and across said surface towards the other of said toy guns, a target member operatively engaged with said housing, and means in said housing responsive to an impact against its associated target member by a projectile discharged from the other toy gun for indicating that said target member has been hit.

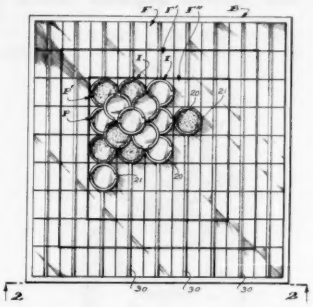
3,891,217
BOARD GAME APPARATUS

Riley R. Geary, and Dennis G. Mehaffey, both of 6202 N. Ivar, Temple City, Pasadena, Calif. 91780

Filed Oct. 9, 1974, Ser. No. 513,416
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—130 R **9 Claims**

1. Game structure for playing a checkers-type game wherein a multiplicity of game pieces are pyramidally stacked on and above a playing field, said structure comprising a substantially flat, horizontal, squarely gridded playing field, said gridded field defining adjacent game piece accommodating stations, a plurality of sets of structurally similar game pieces, the game pieces of each set including identifying means to distinguish those pieces from the pieces of other sets of pieces, each piece comprising a disc-shaped body with a cylindrical peripheral side and substantially flat, horizontal top and bottom surfaces and substantially corresponding in

diametric extent with the lateral extent of the stations defined by the field, said pieces adapted to be arranged in a pyramidal vertical stacked relationship wherein each upper piece is arranged centrally of a related group of four, adjacent, squarely arranged lower pieces with four quarter portions of



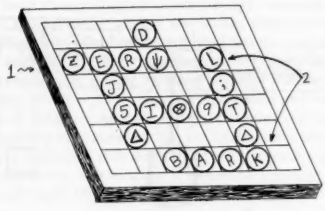
said upper piece opposing and in supported engagement with the inner quarter portions of said related group of four adjacent lower pieces and interengageable orienting means projecting vertically from said pieces to orient each upper piece centrally of its related group of lower pieces and to retain those related pieces against lateral displacement.

3,891,218

DECODING CROSSWORD-TYPE GAME

Carol H. Hilgartner, and Stephen H. Hilgartner, both of 307 Berkeley St., Rochester, N.Y. 14607

Filed May 13, 1974, Ser. No. 469,233
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 E **6 Claims**



1. A decoding crossword-type game apparatus comprising, in combination,

a. game support means having a pattern thereon for receiving marker means bearing thereon the various letters of an alphabet and for maintaining said marker means positioned on said game support means so as to define a crossword array composed of said letters;

i. said alphabet being in one to one correspondence with a first code of symbols, each symbol thereof uniquely representing a said letter of said alphabet;

ii. said alphabet also being in one to one correspondence with a second code of symbols, each symbol thereof also uniquely representing a letter of said alphabet;

iii. said first code being different from said second code;

b. a first plurality of marker means,

i. each of said marker means having thereon a letter of said alphabet;

ii. each of said marker means having thereon a symbol of said first code, the last said symbol thereon being said first code's symbol representing the said letter thereon;

iii. each of said marker means being positionable on said game support means by a player and being operable by said player for exposing, to the view of an observer of said game support means, only the said first code's said symbol thereon;

iv. each of said marker means also being operable by said player for exposing, to the view of said observer, the said alphabet's said letter thereon;

c. A second plurality of marker means substantially equal in number to the first plurality of marker means

i. each said second plurality's marker means having thereon a letter of said alphabet which identically corresponds to the letter of said alphabet appearing on each corresponding one of the first said marker means

ii. each of said second plurality's marker means having thereon a symbol of said second code, the last said symbol thereon being said second code's symbol representing the said alphabet's said letter thereon;

iii. each of said second plurality's marker means being positionable by a player on said game support means and being operable by the last said player for exposing, to the view of said observer, only the said second code's said symbol thereon;

iv. each of said second plurality's marker means also being operable by said last said player for exposing, to the view of said observer, the said alphabet's said letter thereon;

d. said marker means being sufficient in number, and each of said several letters of said alphabet being represented on as many said marker means as is necessary to allow said players to compose said crossword array;

e. the symbol disposed on each of the said first plurality's marker means being different from the symbol which is disposed on each of the said second plurality's marker means whenever the letter of the alphabet disposed on each of the said first plurality's marker means is identical to the corresponding letter of the alphabet disposed on each of the said second plurality's marker means;

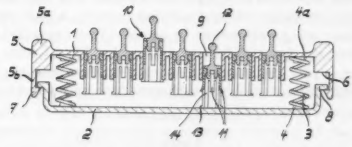
f. each of said first plurality's marker means also having thereon a characteristic means for identifying each marker means as belonging to said first plurality of marker means, each of said second plurality's marker means also having thereon a characteristic means different from the characteristic means on said first plurality's marker means for identifying each marker means as belonging to said second plurality's marker means.

3,891,219

GAME BOARD WITH COLOR DISTINGUISHABLE PLAY PINS AND BORES

Reiner Foerst, Bickenbachstr. 57, 527 Gummersbach 1 - Karlskamp, Germany

Filed Dec. 19, 1973, Ser. No. 426,104
Int. Cl. A63f *3/00*
U.S. Cl. 273—136 F **3 Claims**



1. A game board which includes in combination: a bottom section, a top section, spring means interposed between said top section and said bottom section, said top section and said bottom section being movable relative to each other, said spring means continuously urging said top section away from said bottom section, abutment means associated with said top and bottom sections and operable during a movement of said top section toward and away from said bottom section to limit the minimum and maximum distance respectively therebetween, said top section being provided with a plurality of bores

defined by walls having a lower end face directed toward said bottom section, and a plurality of play pin means projecting above the game board and respectively frictionally slidable in said bores with said play pin means being axially displaceable toward and away from said bottom section, each of said pin means having a skirt with resilient portions having the tendency to bend outwardly for frictional engagement with the wall of the pertaining bore, the improvement therewith comprising a side surface of said bores having a color different from that of the top section of the board, said play pin means being shiftable into two distinct extreme positions and a distinct intermediate base position in each of which three positions said play pin means are frictionally held, each play pin means comprising a slidable part and a handle for pushing and pulling thereof which projects just above said board in the base position of said play pin means, said handle and said slidable part being differently colored such that the surface of the handle and surface of the top section of the board are uniquely colored whereas the surface of the slidable part and the side surfaces of the openings in the board are differently colored.

3,891,220

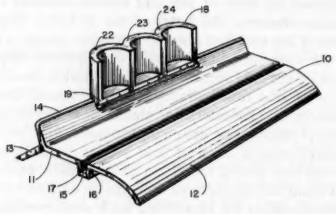
COMBINED CARD AND POKER CHIP HOLDER

Anna P. Driver, 7400 Troon Way, Sacramento, Calif. 95822

Filed Aug. 2, 1974, Ser. No. 494,066

Int. Cl.[2] A63F *1/10*

U.S. Cl. 273—150 **4 Claims**



1. A combined card and poker chip holder comprising, in combination:

a card holder including a base, having a longitudinal extent, a longitudinally extending integral curved front supporting leg, a longitudinally extending integral outwardly and downwardly inclined rear supporting leg, a longitudinally extending upwardly and outwardly inclined lip portion disposed at the rear of the base, a longitudinally extending slot in said base disposed approximately medially of said front and rear legs; and a poker chip attachment for storing poker chips including a base, a pair of spaced depending projections to removably receive the lip portion on the card holder and a plurality of semi-circular upwardly extending poker chip holders that are integral with the poker chip attachment base and with each other.

3,891,221

MAGNETIC GOLF GAME

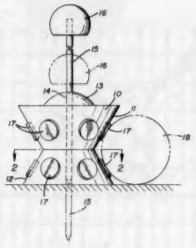
Harold L. Gordon, 1592 First St., Youngstown, Ohio 44509

Filed July 22, 1974, Ser. No. 490,902

Int. Cl. A63b *69/36*

U.S. Cl. 273—177 R **4 Claims**

1. A magnetic target and a ball having magnetically attractable material therein, the magnetic properties of the target and the ball being such that the ball will be held in place against the target upon impact of the ball therewith, said target being circular and having at least one flat surface forming a base, the upper half of the circular target being frustum shaped with the largest diameter at the top and the lower half of the circular target being a reverse frustum shape relative



thereto with its larger diameter end forming said flat surface and base.

3,891,222

STYLUS RECONDITIONING DEVICE

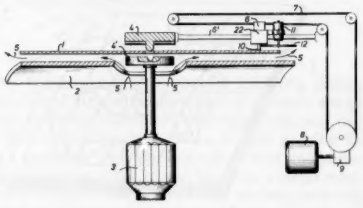
Gunter Wimmer; Jürgen Wilisch, and Jurgen Heller, all of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Zug, Switzerland

Filed Aug. 29, 1974, Ser. No. 502,235

Claims priority, application Germany, Aug. 29, 1973, 2344105

Int. Cl. G11b *31/00*

U.S. Cl. 274—1 R **6 Claims**



1. In a signal reproducing apparatus including means for supporting a signal carrier body; a signal pickup stylus mechanically contacting the signal carrier body during signal reproduction; a mechanism for moving the stylus with respect to the signal carrier body during signal reproduction; and grinding means, including a grinding member, for reconditioning the stylus during pauses of signal reproduction, the improvement comprising

a. a carriage forming part of said mechanism for moving the stylus;

b. a holder supporting said stylus and mounted on said carriage;

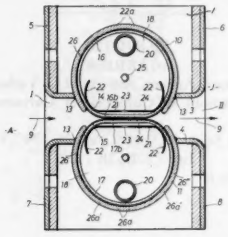
c. means for securing said grinding member to said carriage; and

d. means for relatively moving said stylus and said grinding member into engagement with one another for reconditioning those parts of said stylus that contact the signal carrier body during signal reproduction.

3,891,223
SEAL FOR TREATMENT CONTAINERS, ESPECIALLY FOR WIDTH OF TEXTILE GOODS

Rudolf Sonnen, Krefeld, Germany, assignor to Kleinewefers Industrie Companie GmbH, Germany

Filed June 20, 1974, Ser. No. 481,242
Claims priority, application Germany, June 20, 1973, 2331367
Int. Cl. D06f *39/00;* **F16j** *15/54*
U.S. Cl. 277—32 **8 Claims**



1. In combination in a treatment container having oppositely located side walls with an inner slot and an outlet slot respectively for introducing a width of goods into and withdrawing it from said container, and also having oppositely located end walls, a pair of substantially cylindrical rim means having their ends supported by some of said walls and being arranged in substantially parallel adjacent relationship to each other, those peripheral portions of said rim means which in the longitudinal direction thereof are adjacent to each other being provided with slot means facing each other, two inflatable hoses respectively located in said rim means and approximately parallely to each other bridging the respective pertaining slot means while across said slot means forming yieldable sealing bead means adapted to receive therebetween the width of goods to be treated, sealing disc means arranged at substantially the ends of said hose means and tightly closing the pertaining ends of said hose means, wear-resistant flexible foil means respectively having an inner contour substantially corresponding to the outer contour of said hoses, and while being interposed between the pertaining rim means and the respective pertaining hose surrounding the latter, and conduit means respectively leading into and out of said hoses for selectively and respectively introducing a pressure medium into and releasing it from said hoses.

3,891,224
JOINT ASSEMBLY FOR VERTICALLY ALIGNED SECTIONALIZED MANHOLE STRUCTURES INCORPORATING D-SHAPED GASKETS

John Ditcher, Langhorne, Pa., assignor to A-Lok Corporation, Trenton, N.J.

Filed Mar. 20, 1974, Ser. No. 452,677
Int. Cl. F16j *15/10*
U.S. Cl. 277—207 **13 Claims**

1. A watertight joint assembly for cooperating sections of manhole structure;

a first cylindrical section having a male end;

a second cylindrical section having a cooperating female end;

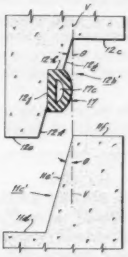
said female end having a flat interior annular load bearing surface spaced inwardly from one end and an inclined interior surface extending between said end and said load bearing surface;

said male end having an exterior annular shaped surface along the exterior surface of said first section, said surface being spaced inwardly from the adjacent end of said first section;

said adjacent end of said first section being flat;

said first section further including an inclined exterior surface extending between said exterior annular surface and said flat end, said inclined surface having an L-shaped notch positioned between said exterior annular surface and said flat end one surface of said notch forming a shoulder;

a closed-loop resilient gasket having a substantially D-shaped cross-section so that the interior surface of said gasket is substantially straight;



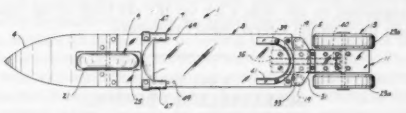
said gasket being positioned in said notch;

said gasket being compressed against said female end inclined surface when said fenale end flat interior annular surface and the flat end surface of said male end are in contact thereby cooperating to form the load bearing surfaces of said joint whereby the weight of the upper section urges said sections into engagement and urges said gasket into its compressed state.

3,891,225
WHEELED SKI SKATE

Raymond V. Sessa, 34 Girard St., Marlboro, N.J. 07746

Filed Apr. 22, 1974, Ser. No. 462,873
Int. Cl. A63c *1/28*
U.S. Cl. 280—11.19 **4 Claims**



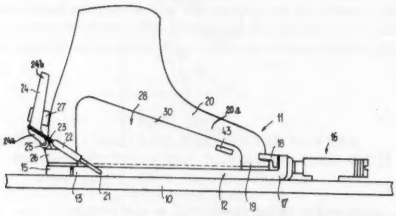
1. Apparatus for simulating skiing including a pair of ski skates, each ski skate comprising an elongate first platform, means on said first platform for securement to the foot of a skier, first roller means carried by said first platform, a second platform, second roller means carried by the second platform, and means interconnecting said first and second platforms for enabling rotation of the first platform relative to the second platform about a longitudinal axis of the ski skate, said interconnecting means including an axial hinge interconnecting said platforms and permitting relative rotation of the platforms about said longitudinal axis, and spring means interposed between said platforms for biasing said platforms to a generally neutral position in which said platforms are generally coplanar, whereby said skier shifting his weight on the first platform causes relative rotation of the first platform relative to the second platform, wherein one of said platforms has a first bracket secured thereto extending out over the adjacent end of the other of said platforms and said other platform has a second bracket secured thereto having a portion thereof in spaced vertical relation to a portion of said first bracket, said spring means comprising a pair of compression coil springs, one on one side of the axis of said axial hinge and the other

on the other side thereof, said springs being interposed between said portions of said first and second brackets.

3,891,226
RELEASABLE SKI BINDING

Ernest Gertsch, Wegen, and Ulrich Gertsch, Interlaken, both of Switzerland, assignors to Gertsch AG, Interlaken, Switzerland

Filed Apr. 9, 1973, Ser. No. 349,286
Claims priority, application United Kingdom, Apr. 17, 1972, 17569/72
Int. Cl. A63c *9/086*
U.S. Cl. 280—11.35 K **10 Claims**

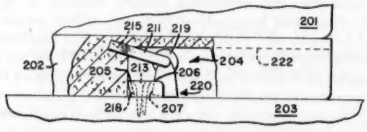


1. A releasable ski binding having a release plate which can be releasably retained at the ski by locking elements anchored at the ski, clamping elements for clamping the sole of a ski boot having an upper to the binding, said release plate having a support surface and lengthwise extending sides, at both lengthwise extending sides of the release plate there are provided lateral impact members extending over the major portion of the length of the ski boot and protruding upwardly from the support surface of the release plate, means for rigidly yet adjustably securing said lateral impact members at the release plate, each of said lateral impact members forming at least two lateral impact points for engagement with the upper of the ski boot which is to be clamped at the binding, said lateral impact members cooperating with said release plate such that lateral forces acting upon the leg of the skier are transmitted by the skier's leg via the ski boot to the release plate through the lateral impact members.

3,891,227
RELEASABLE SKI BINDING

Richard G. Spademan, 933 Addison Ave., Palo Alto, Calif. 94301

Continuation-in-part of Ser. No. 136,826, April 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 868,271, Oct. 7, 1969, Pat. No. 3,606,370, which is a continuation-in-part of Ser. No. 769,682, Oct. 22, 1968, abandoned. This application Jan. 29, 1974, Ser. No. 437,719
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 R **19 Claims**

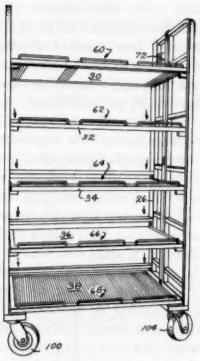


1. A releasable ski binding for releasably securing a ski boot to a ski comprising:
a first engaging means located on one of said ski boot and said ski;
a second engaging means located on the other of said ski boot and said ski;
a third means coupled to said first engaging means for resiliently biasing said first engaging means into releasable engagement with said second engaging means for releasably securing said ski boot to said ski at a point interior of the side and rear edges of said ski boot; and
a fourth means for permitting upon disengagement of said first and said second engaging means a separation of said ski boot from said ski without requiring heel lifting movement of said ski boot relative to said ski.

3,891,228
CARRIER

Vance E. Rhinehart, Apison, and Floyd G. Yother, Daisy, both of Tenn., assignors to Cumberland Corporation, Chattanooga, Tenn.

Filed Sept. 17, 1973, Ser. No. 397,979
Int. Cl. B62b *11/00*
U.S. Cl. 280—36 R **10 Claims**



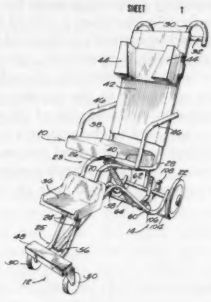
1. A carrier for containers or the like comprising:
a frame including first and second hollow, vertical, tubular members each having a groove on the side facing the other hollow member,
a plurality of shelves mounted on said frame and each having an extending surface,
a back bar extending along one side of each of a number of said shelves,
means mounting each said back bar on said frame so that each said bar can be moved from a position slightly above said extending surface of that shelf to a position substantially flush with said extending surface of said shelf,
means mounted on said frame for urging each said back bar toward said position slightly above said extending surface including further members each movable in one of said vertical members and having a portion extending through said groove and engaging an end of said back bar, and a spring within each said vertical member and connected to said further member in that vertical member exerting a force on that further member to urge that member and that back bar to said position substantially flush with said extending surface of said shelf.

3,891,229

TRAVEL CHAIR

Edward J. Gaffney, Pewaukee, Wis., assignor to Orthokinetics, Inc., Waukesha, Wis.

Filed Mar. 14, 1974, Ser. No. 451,251
Int. Cl. B62b *11/00*
U.S. Cl. 280—41 B 11 Claims



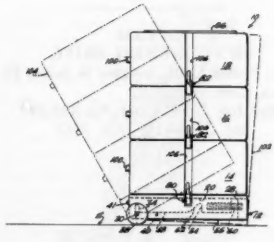
1. In a wheel chair having a seat portion, a front leg portion, and a rear wheel assembly, the improvement wherein said front leg portion is so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof whereby said front leg portion is placed in support relation to the automobile and will support the seat portion from the automobile in the course of subsequent movement of the wheel chair into the automobile, and means for retracting said rear wheel assembly upwardly independently of any change in the position of the front leg portion with respect to the seat portion and to a position which clears the space beneath the rear end of the chair and permits the chair seat portion and retracted rear wheel assembly to be swung over and set upon said automobile seat.

3,891,230

WHEELED CART SUPPORTED LUGGAGE

Fred Mayer, 7080 N.W. 37th Ct., Miami, Fla. 33147

Filed Aug. 5, 1974, Ser. No. 494,468
Int. Cl. B62d *33/08*
U.S. Cl. 280—43.24 8 Claims



1. A mobile carrier and luggage for fixed, removable attachment thereatop in a stacked arrangement, the combination comprising;

A. a cart including,

1. a top wall,
2. a peripheral skirt comprising depending front, back, and opposed side walls,
3. a transverse axle spanning the width of said cart adjacent to said front wall and extending outwardly through vertical slots in said opposed side walls,
4. a pair of front wheels fixed respectively to the opposed axle end portions, and
5. leg means to selectively maintain said wheels in supporting engagement with a support surface or to simultaneously disengage said supporting wheel engagement and to extend substantially forwardly of said cart into engagement with said support surface to counterbalance a forwardly overbalanced condition of the luggage;

B. a plurality of luggage carriers such as suitcases, each including

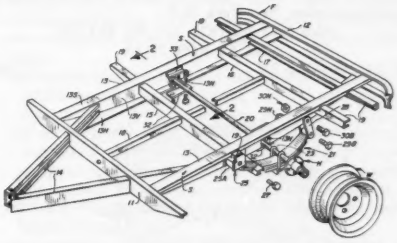
1. front, back, top, bottom and opposed end walls defining an interior chamber,
2. a drawer, including releasable lock means to maintain said drawer in a normally closed position slidable into and out of said interior chamber through said front wall,
3. latch means to interconnect said cart and plurality of suitcases in a vertically aligned, stacked relation.

3,891,231

TRAVEL TRAILER FRAME AND SUSPENSION

Robert C. Snoberger, Goshen; Thomas C. Delker, South Bend, and Richard L. Reschly, Goshen, all of Ind., assignors to Travel Equipment Corporation, Goshen, Ind.

Filed Oct. 21, 1974, Ser. No. 516,351
Int. Cl.[2] B60G *11/04*
U.S. Cl. 280—106.5 R 5 Claims



1. A multi-purpose support frame and axle suspension assembly for trailer type vehicles and comprising a pair of truss-like horizontal main rails, providing planar box support surfaces, each rail tapering vertically forwardly and rearwardly of an intermediate axle mounting section thereof; each intermediate mounting section having a downwardly opening mounting notch; a straight axle extending between and projecting beyond the main rails; a leaf spring assembly for supporting each rail from a corresponding end of the axle; and mounting means for connecting each leaf spring assembly to the corresponding rail to position the axle ends within the mounting notches for accommodating relative vertical travel therebetween.

3,891,232

INDEPENDENT WHEEL SUSPENSION FOR MOTOR VEHICLES

Helmut Flemming, Kemnat, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

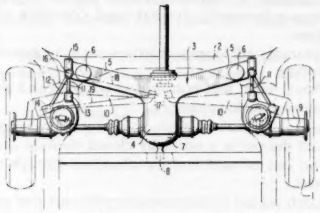
Filed Dec. 21, 1973, Ser. No. 427,308
Claims priority, application Germany, Dec. 23, 1972, 2263356
Int. Cl. B60g *11/16*
U.S. Cl. 280—124 A 30 Claims

1. An independent wheel suspension for supporting a wheel at a vehicle body comprising:

a wheel carrier means for directly rotatably supporting a wheel, said wheel carrier means being movable with said wheel,

a cross guide means fixedly connected to said wheel carrier means and pivotally mounted at a vehicle body by a first pivot mounting.

an upper longitudinal guide means pivotally mounted at said wheel carrier means by a second pivot mounting and



pivotally mounted at said vehicle body by a third pivot mounting,

and a lower longitudinal guide means separate from said upper guide means and pivotally mounted at said wheel carrier by a fourth pivot mounting and pivotally mounted at said vehicle body by a fifth pivot mounting.

3,891,233

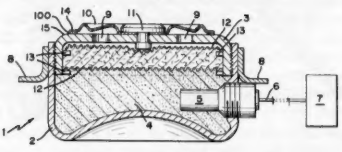
INFLATOR SEAL

William H. Damon, Newhall, Calif., assignor to Allied Chemical Corporation, New York, N.Y.

Filed June 20, 1974, Ser. No. 481,293

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 AB **5 Claims**



1. A source of gas including a chamber from which inflating gas is developed, exit ports at one side of said chamber, a seal means overlying said exit ports, said seal means including a seal disc and adhesive, said seal disc containing at least one convolution, said seal disc attached to said source by said adhesive binding the outer extent of said seal disc to said source, said adhesive rupturing at a pressure lower than the pressure of the inflating gas exiting from said source, said gas directed by said seal disc on exiting from said exit ports to pass through said adhesive on rupture thereof, and said seal disc further attached to said source at a location separate from the area of adhesion to said source.

3,891,234

TOY VEHICLE FOR TRANSPORTING AT LEAST THE VEHICLE OPERATOR

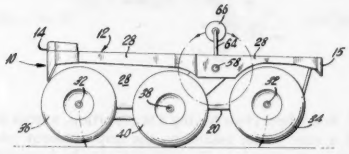
Robert Thomas Auer; Laurie Jay Campbell; Raymond J. Lohr, and James Smith, all of Erie, Pa., assignors to Marx Toys Division of The Quaker Oats Company, Stamford, Conn.

Continuation of Ser. No. 234,120, March 13, 1972, abandoned. This application Feb. 19, 1974, Ser. No. 443,878

Int. Cl. B62m *1/14*

U.S. Cl. 280—211 **2 Claims**

1. In a toy vehicle a molded chassis for carrying at least an operator of the vehicle the rear end of said chassis forming the back of a seat on which the operator can be seated, the seat extending at a front wall thereof upwardly from a floor portion, said floor portion being formed with a central portion which defines two openings in said floor said central portion providing structural support to said chassis and the openings defined thereby providing sufficient clearance for the hands of an operator seated in the seat of said chassis and wheel means located at opposite sides of said chassis for supporting the latter for traveling movement, said wheel means including a pair of intermediate coaxial wheels respectively located at opposite sides of said chassis means between opposed ends thereof, a single shaft common to said pair of intermediate coaxial wheels and rotatably supporting same for free rotary movement independently of each other, a pair of drive means carried by said chassis and operatively connected to said pair of intermediate coaxial wheels, respectively, for driving said intermediate coaxial wheels independently of each other, and a pair of control means accessible to the operator and respectively connected operatively with said pair of drive means for controlling the latter as selected by the operator to propel the vehicle in a selected direction said wheel means further including at least two pairs of coaxial wheels respectively situated forwardly and rearwardly of said pair of intermediate



coaxial wheels, said front and rear wheels respectively having peripheries situated with respect to the periphery of said pair of intermediate coaxial wheels at elevations which provide for said chassis means a rocking movement around the common axis of said intermediate coaxial wheels forwardly onto said front wheels or rearwardly onto said rear wheels said chassis including inner opposed side walls which extend substantially perpendicular to said seat and floor portion at opposite sides thereof, said side walls defining restraining walls for an operator seated therebetween, and also includes two pairs of tubular portions formed with transverse openings therein, the first pair of said tubular portions being rearward of said single shaft and said other pair of tubular portions being forward of said single shaft, and a forward shaft and rearward shaft for respectively supporting said front and rear wheels, said shafts being rotatably supported in said pairs of tubular portions transverse openings, said openings being disposed to provide said rocking movement to said forward and rearward wheels about said intermediate wheels, by being at a higher elevation than said single shaft.

3,891,235

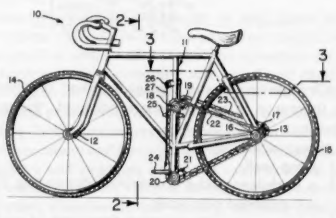
BICYCLE WHEEL DRIVE

Jacques Shelly, Venice, Calif., assignor to James De Cordova, Santa Monica, Calif.

Filed July 2, 1974, Ser. No. 485,297

Int. Cl.[2] B62M *1/04, 9/02*

U.S. Cl. 280—252 **3 Claims**



1. A wheel drive for a bicycle having a frame rotatably

supporting the axles of front and rear bicycle wheels, including, in combination:

a. left and right rear wheel sprockets on either side of the rear wheel rotatably mounted to said frame;

b. left and right ratchet means coupling said sprockets to opposite ends respectively of the rear wheel axle such that rotation of either one of said sprockets in a first direction drives the rear wheel in a like direction and rotation of either one of the sprockets in a second opposite direction results in a decoupling of the ratchet means associated with the particular sprocket rotated in said opposite direction so that said wheel is unaffected by said particular sprocket;

c. upper and lower pairs of pedal sprockets each comprising individually rotatable left and right pedal sprockets on either side of said frame rotatably mounted at upper and lower portions of said frame respectively, said pairs being in substantial vertical alignment;

d. left and right bicycle chains passing respectively over the left upper and lower pedal sprockets and left rear wheel sprocket and over the right upper and lower pedal sprockets and right rear wheel sprocket;

e. left and right pedals respectively coupled to intermediate portions of said left and right chains between the upper and lower pairs of pedal sprockets, whereby a downward driving force alternately exerted on said pedals by a bicycle rider will drive the rear wheel of said bicycle in said first direction to propel said bicycle forwardly;

f. left and right generally vertically disposed guide means coupled to said frame, the chain portion to which said pedals are coupled passing within said guide means such that the pedals are constrained to move in rectilinear paths, said guide means supporting said upper and lower pairs of pedal sprockets; and

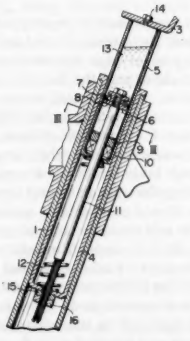
g. mounting means for coupling said guide means to said frame for tilting movement fore or aft whereby the direction of rectilinear motion of the pedals can be altered slightly from a vertical direction.

3,891,236

SHOCK ABSORBER FOR BICYCLES

Nobuyori Kuwano, and Yasutomo Tajima, both of Gyoda, Japan, assignors to Showa Manufacturing Co., Inc., Tokyo, Japan

Filed Jan. 24, 1973, Ser. No. 326,468
Claims priority, application Japan, Aug. 31, 1972, 47-87399
Int. Cl. B62k *21/14*
U.S. Cl. 280—283 **2 Claims**



1. In combination, a bicycle and a shock absorber comprising a bottom cylinder having a circular outside surface and a polygonal inside surface fitted into the upper end of a pipe forming part of the frame of said bicycle, an oil cylinder having a polygonal outside surface mated to said polygonal inside surface of said bottom cylinder and a circular inside surface fitted slidably but nonrotatably in said bottom cylinder by virtue of said mated polygonal surfaces of said bottom and oil cylinders and connected at its upper end to a passenger-engaging element of said bicycle, piston means co-acting with said bottom cylinder and said oil cylinder, damping means provided on said piston means to generate a damping force in said oil cylinder, spring load means stretched between the bottom surface of said bottom cylinder and the oil cylinder, adjustable fastening means fitted to said piston means at its lower end and cooperating with a mating portion at the bottom surface of said bottom cylinder so that the spring set load is adjustable.

3,891,237

TRAILER HITCH

Bill Allen, 711 S. Austin, Marietta, Okla. 79088

Filed Mar. 29, 1974, Ser. No. 456,512
Int. Cl. B60d *7/00*
U.S. Cl. 280—477 **4 Claims**

1. A trailer hitch for automatically coupling a traction vehicle to a towed vehicle, comprising:

an elongated shank having a keeper notch adjacent one end;

an elongated socket member having an axial bore in one end portion for receiving the notched end portion of said shank,

said socket member having a bell-shaped flange coaxial with the axial bore and having a lateral opening communicating with the axial bore,

said socket member having an upwardly open elongated recess in its end portion opposite the axial bore forming opposed upstanding walls and a transverse upstanding stop section between the axial bore and the recess,

said stop section forming the inward limit of the socket member axial bore;

a pawl pivotally connected with said socket member and engageable with the keeper notch,

said pawl being disposed between said walls within the elongated recess in overlying relation intermediate its ends with respect to said stop section and having a part-cylindrical portion abutting said stop section opposite said shank; and,

a spring normally biasing said pawl into the socket member lateral opening,

whereby said stop section, by being disposed between the rearward limit of said shank and said pawl part-cylindrical portion, prevents forward or rearward movement of a towed vehicle with respect to a towing vehicle.

3,891,238

TRAILER HITCH

Elmer R. Ehlert, 308 Independence, Pella, Iowa 50219

Filed Feb. 6, 1974, Ser. No. 439,897
Int. Cl. B62d *53/00*
U.S. Cl. 280—446 R **5 Claims**

1. A trailer hitch for attachment to a towing vehicle, said hitch comprising:

a hitch frame secured to the underside of the vehicle at the rear thereof with said hitch frame including a rear rail in juxtaposition to the rear extremity of the vehicle and disposed transversely of the direction of forward vehicle travel,

an elongated tongue having a forward and rear end,

means for pivotally securing the forward end of said tongue to said hitch frame forwardly of the rear end of said vehicle so that the rear end of said tongue extends rear-

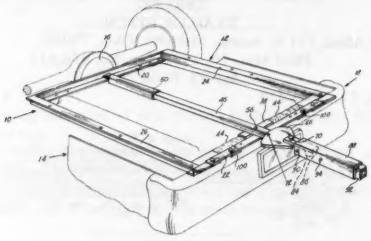
wardly beyond the rear extremity of the vehicle and can swing laterally in two opposite directions relative to the rear of the vehicle,

means slidable on said hitch frame adjacent said rear rail and operatively connected to said tongue to guide said tongue in its lateral swing movements,

a plate disposed at the underside of the rear end of said tongue and pivotally secured at one end thereto,

hitch means operatively secured to said plate so as to be movable therewith,

releasable lock means operable relative to said tongue and said plate for normally maintaining said hitch means in longitudinal alignment with said tongue,



lock actuating means on said rear rail at spaced points thereon at opposite sides relative to the center line of the towing vehicle whereby in the swing movement of said tongue said releasable lock means is engageable with and acted upon by said lock actuating means to release the same so that said plate is pivoted to effect the pivotal movement of said hitch means out of longitudinal alignment with said tongue, and

means on said rear rail cooperating with said releasable lock means to effect the transfer of its interlocking effect between said tongue and said plate to interlocking engagement between said tongue and said rear rail.

3,891,239

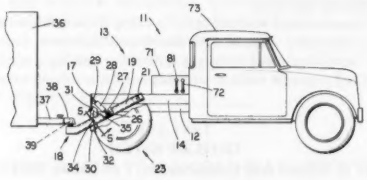
HYDRAULICALLY OPERATED HITCH FOR TOWING AND POSITIONING MOBILE HOMES

Jack D. Leo, 2045 Winton Ave., Speedway, Ind. 46224, and Lee Benedict, R.R. 2, Box 167, Camby, Ind. 46113

Filed Apr. 15, 1974, Ser. No. 460,713

Int. Cl. B62d *53/04*

U.S. Cl. 280—479 R **11 Claims**



1. Apparatus for towing and positioning mobile homes, comprising:

a tractor truck having a rear axle;

a hitching ball;

a towing frame pivotably mounted to said truck, said frame having said ball mounted to the rear end thereof behind said truck, and said frame having its pivotal mounting to said truck ahead of the rear axle of the truck;

a fluid driven actuator connected to said truck and to said frame and operable to raise said frame for lifting a towing tongue of a mobile home when connected to said ball;

the pivotal mounting of said frame to said truck being ahead of the rear axle and sufficiently above the rear axle to locate said ball close to the rear end of said truck and enable said fluid driven actuator to raise and lower said ball through various levels near the level of the rear axle of said truck, without interference of said frame with said axle.

3,891,240

BOOK COVER

Gerard M. Du Corday, 10871 Thorley Rd., Santa Ana, Calif. 92705

Filed Apr. 30, 1973, Ser. No. 355,654

Int. Cl. B42d *3/00*

U.S. Cl. 281—29 **6 Claims**

1. A custom fitted book protector for use with a book having front and back covers and a spine, comprising:

a. a protector sheet having inner and outer surfaces and having a score line for severing said protector sheet into first and second protector parts,

said score line being in said outer surface of said protector sheet and comprising a depth, V-shaped groove significantly attenuating the strength of said protective sheet, whereby when said protector sheet is severed along said groove into said first and second protector parts, said first and second protector parts will each have a beveled edge,

said first protector part having a first pocket for receiving one of said book covers and having a first body section adapted to extend from the front of said book along the outside of said one cover and over and around said spine of said book, and including a return portion adapted to extend along the outside of the other of said covers,

said first body section having an extent considerably greater than the extent of said first pocket, and terminating in an edge lying along a line intermediate to the front and back of said other cover, said edge initially being adjacent to said score line of said protector sheet and being beveled to slope toward said other cover and the front of said book,

said second protector part having a second pocket for receiving said other book cover and having a second body section adapted to extend from the front of said book along the outside of said other cover toward said spine,

said second body section having an extent slightly greater than the extent of said second pocket and terminating in an edge intermediate to the back of said other cover and the beveled edge of said first body section, whereby said return portion of said first body section overlaps said edge of said second body section for a portion of their common extend along said outside of said other cover when said first and second body sections are pulled tightly and closely along the outside of said covers of said book, said edge of said second body section initially being adjacent to said score line of said protector sheet and being beveled to slope from said other cover and toward the back of said book, and

b. adhesive means for interconnecting said overlapped areas of said first and second body sections, comprising an adhesive strip secured to the inside of said first body section adjacent said beveled edge thereof,

said adhesive strip being adhesively secured to the outside of said overlapped area of said second body section, whereby said covers and spine of said book are covered by said first and second protector parts and whereby said beveled edge of said first body section provides a snag-proof joint between said first and second parts

minimizing subsequent peeling of said adhesive interconnection.

3,891,241

VEHICLE SUSPENSION SYSTEMS

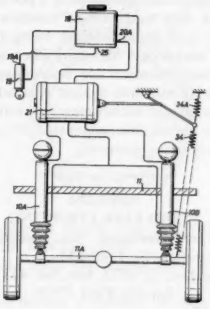
Wilfred Nicholas Bainbridge, and David Parsons, both of Warwickshire, England, assignors to Automotive Products Co., Ltd., Leamington SPA, England

Filed Feb. 20, 1973, Ser. No. 333,627

Claims priority, application United Kingdom, Feb. 21, 1972, 7921/72

Int. Cl. B60g *11/26*

U.S. Cl. 280—124 F 11 Claims



1. A vehicle suspension system including two telescopic struts comprising one strut element for connection to a respective axle of the vehicle and another strut element for connection to the body of the vehicle, a liquid reservoir, a liquid pump arranged to draw liquid from the liquid reservoir and to feed it under pressure through one non-return valve to the interior of one of the telescopic struts and through another non-return valve to the interior of the other of the telescopic struts, and a control valve operable in accordance with relative movement between an axle and the body of the vehicle, the control valve, which connects the pump output to the reservoir normally, being disposed to increase the pressure of liquid supplied by the pump to the non-return valves when the loading of the vehicle is increased so that liquid under the increased pressure is fed through the non-return valves to the interior of the telescopic struts, and to place the interior of the telescopic struts in communication with the reservior when the loading of the vehicle is decreased, so that liquid is discharged from the telescopic struts, said pump being disposed to supply liquid to each non-return valve through said control valve, the said control valve having a valve spool coupled to an axle of the vehicle and slidable in a bore in a valve body which is fixed to the vehicle body, and including damping means incorporated in the control valve, the damping means being arranged to damp movement of the valve spool away from the normal position in which it connects pump output to the reservoir, the arrangement being such that return movement of the valve spool to the normal position is relatively free, said bore being a through bore and said valve spool is longer than said bore, each end of said valve spool being fixed to a respective movable wall, and each movable wall and the adjacent end of said valve body comprising opposite walls of a respective variable volume chamber which is in restricted communication with the reservoir at least when said valve spool is in the said normal position, or is moved theretowards from said normal position.

3,891,242

TRANSFER MATERIALS

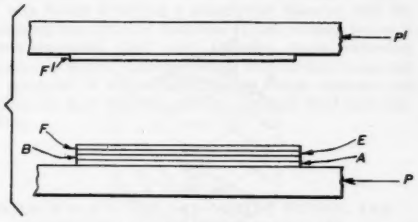
Raymond Mills Arnold, and Alec Walter George Stubbings, both of 195-203 Waterloo Rd., London, England

Filed May 24, 1973, Ser. No. 363,726

Claims priority, application United Kingdom, May 24, 1972, 24485/72

Int. Cl. B42d *15/00*

U.S. Cl. 283—6 6 Claims



1. A transfer material which comprises a base sheet, at least one non-transferable indicium on a surface of said base sheet, a transferable opaque layer covering at least a portion of said non-transferable indicium, an adhesive layer upon an area of said transfer material which can be juxtaposed above said transferable opaque layer, said adhesive layer being effective to remove said transferable opaque layer upon contact therewith from its original position to thereby expose said non-transferable indicium.

3,891,243

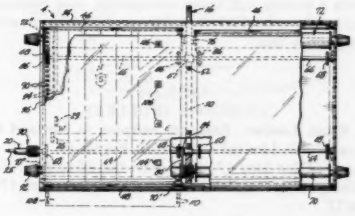
AUTOMATIC ROUTE INFORMATION DISPLAY

Charles Pelin, P.O. Box 98245, Eastsound, Wash.

Division of Ser. No. 265,647, June 23, 1972. This application July 2, 1973, Ser. No. 375,629

Int. Cl.[2] G09B *22/00*

U.S. Cl. 283—35 1 Claim



1. In an automatic route information display device, a pair of elongated, relatively superposed roadway route information strips, each having longitudinally successive indicia of a roadway route thereon, the roadway of which route in actuality undergoes a turn at an intermediate point in the space between spaced points thereon, but said spaced points and said intermediate point of said roadway being represented by the indicia as lying on a rectilinear course of travel lengthwise of the strip, and the distances between the respective spaced points and the intermediate point of the roadway represented on the lower of the strips, being represented in accordance with different scales of distance lengthwise of the course of travel thereon, mutually coincident tooth engaging means on the strips at longitudinally successive intervals thereof, and longitudinally successive magnetic tracks on the lower strip, coordinated with the change between the scales of distance thereon, to indicate the change in scale to an electromagnetic detection means used therewith, the scale of distance of the upper strip being the same as one of the scales of distance on the lower strip.

3,891,244

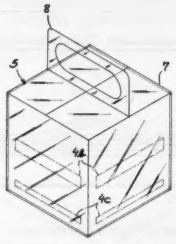
NOTEPAD

Karl Hermann Ritter, Sachenstr. 5, and Johannes Andreas Ritter, Thuringersr. 5, both of 61 Darmstadt-Eberstadt, Germany

Continuation-in-part of Ser. No. 232,749, March 8, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 393,800

Int. Cl. G09f *23/10*

U.S. Cl. 283—56 2 Claims



1. A binderfree notepad comprising:

a multiplicity of congruent substantially square sheets arrayed one atop the other coextensively in a generally cubical stack having a height equal generally to the length of a sheet side, said stack having a plurality of lateral faces defined exclusively by the coestensive edges of said sheets;

an adhesive bond on one of said faces securing said sheets together at said one face by the sheet edges forming said one face, said sheets being readily separable from said stack at said edges forming said one face;

a screen-printed pattern on each of said faces extending over substantially all of the sheet edges forming said faces; and

a synthetic resin wrapping conforming to the stack and completely surrounds same said wrapping being provided with a handle and being transparent, said patterns each including a background color completely covering the respective face.

3,891,245

LUGGAGE TROLLEYS

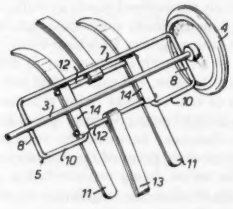
Tibor Elsas, London, England, assignor to Norland Gazelle Travel Goods Limited, Middlesex, England

Filed May 17, 1973, Ser. No. 361,369

Claims priority, application United Kingdom, May 17, 1972, 23090/72

Int. Cl. B62b *1/12*

U.S. Cl. 280—47.13 R 1 Claim



1. A trolley for attachment to a corner of a suitcase to provide a support therefore, said trolley comprising an angled support assembly shaped to receive said corner of said suitcase, means for releasably securing said support assembly to said suitcase, a chassis assembly including a pair of ground-engaging wheels, and connecting means detachably securing said chassis assembly to said support assembly, said connecting means comprising inherently resilient projection means fast with said chassis assembly and socket means cooperating with said projection means and fast with said supporting assembly, and means for preventing disengagement of said cooperating projection means and socket means when said projection means and socket menas are fully engaged in a first position with said projecting means unstressed, wherein said projection means are movable against said inherent resilience to a second position clear of said means for preventing disengagement and in which said projection means and socket means can be disengaged to release said chassis assembly from said support assembly, said projection means comprising two parallel, spaced-apart projecting members which extend transversely of an axis of rotation of said ground-engaging wheels and which form part of a frame, and said socket means comprising a pair of correspondingly spaced-apart tubular socket members fast with said support assembly, and said means for preventing disengagement comprising a portion of said frame which is parallel with said axis of rotation of said ground engaging wheels, said frame portion being normally aligned with the ends of said socket members when said socket members and projection members are interengaged, said projection members being movable against said inherent resilience sufficiently to spring said socket members out of line with said frame portion to permit disengagement of said socket members and said projection members.

3,891,246

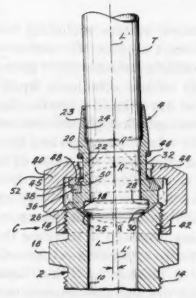
FLUID LINE COUPLING

Richard A. Hopper, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 3, 1973, Ser. No. 421,024

Int. Cl. F16l *17/00*

U.S. Cl. 285—110 11 Claims



1. A fluid line coupling comprising: a first tubular element having a fluid channel and concave spherical seating surface surrounding the end of the fluid channel, the concave seating surface being metal and being in a fixed position on the first element; a second tubular element having a fluid channel therein and a convex spherical seating surface surrounding the end of the fluid channel, the convex surface being metal and being in a fixed position on the second element, the convex surface further being of the same curvature as the concave surface of the first element and being abutted against that concave surface, whereby the spherical seating surfaces have a common center of curvature; a convex spherical bearing surface carried by the second tubular element in a fixed position thereon, the bearing surface away from the convex seating surface, the center of curvature for the bearing surface being offset from the common center of curvature for the seating surfaces; a slip ring surrounding the second element and having a beveled surface against the spherical bearing surface on the second element; and clamping means contain-

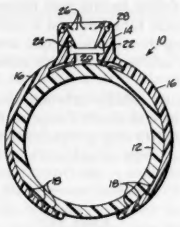
ing the slip ring and being engaged with the first tubular element for applying an axially directed force to the slip ring to urge the slip ring against the bearing surface and thereby force the convex and concave seating surfaces tightly together, the clamping means loosely receiving the slip ring in the radial direction so that the slip ring may slide laterally within the clamping means and is located in the radial direction by the convex bearing surface.

3,891,247

PLASTIC ONE-PIECE SADDLE FOR PLASTIC PIPE

Lynn Elwyn Smith, Box A-E, San Luis Obispo, Calif. 93401

Filed Apr. 8, 1974, Ser. No. 458,827
Int. Cl. F16l *5/00*
U.S. Cl. 285—110 **14 Claims**



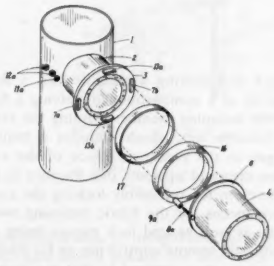
1. A plastic saddle for plastic pipe and comprising,
a central boss for a branch pipe,
at least one side band depending from each side of the central boss,
each side band having a molded in diameter somewhat smaller than the outside diameter of the plastic pipe, and holding means including sharp points projecting from the inside surface of each band near the lower end of the band and effective to grip into the outer surface of the plastic pipe.

3,891,248

EXPANSION JOINT

David H. Kannapell, Prospect; Philipp P. Schupp, La Grange; David L. Amrein, Louisville, all of Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed May 9, 1974, Ser. No. 468,556
Int. Cl. F16l *41/00, 51/00*
U.S. Cl. 285—156 **7 Claims**



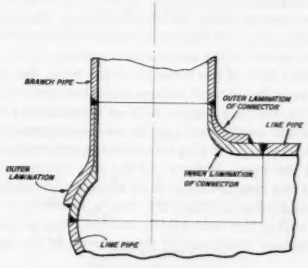
1. An expansion device which allows for expansion and contraction along an axis longitudinal to said device and along an axis normal to said device comprising: first and second longitudinally extending conduit members joined in flow communication one with the other; said first conduit member having a radially outward extending flange at one end thereof, said flange having a pair of opposed spaced vertically extending slotted openings, with respect to said longitudinally extending conduit members, therein and stop means thereon extending outwardly therefrom substantially parallel with the longitudinal axis of said first conduit member; said second conduit member having a radially outward extending flange on one end thereof facingly opposed to said flange on said first conduit, said flange on said second conduit having a pair of opposed apertures therein, said apertures spaced from and in alignment with said slotted openings on the flange of said first conduit; flexible packing means disposed between said opposed flanges and in communication with said first conduit flange and said second conduit flange in fluid tight relation, said stop means extending a preselected distance, said distance being less than the thickness of said packing means in a noncompressed state; and, fastening means extending through said slotted openings of said first conduit flange and said apertures of said second conduit flange whereby said conduits are held together in a flow through fluid tight connection.

3,891,249

DOUBLE PLATE WELDED OUTLET FITTING AND METHOD OF OBTAINING THE SAME

Charles H. Moore, 645 Matanzas Ct., Fort Myers Beach, Fla. 33931

Filed Feb. 16, 1973, Ser. No. 333,011
Int. Cl. F16l *13/02*
U.S. Cl. 285—189 **3 Claims**

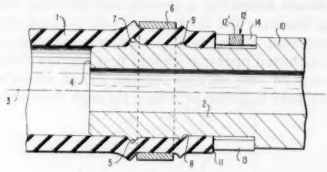


1. A dual thickness metallic outlet fitting adapted to be welded to an opening in a main tubular member at one end and welded to a branch pipe at the other end, comprising a passageway through the fitting for providing communication between the main tubular member and the branch pipe
a. said fitting being composed of two centrally apertured initially circular metallic plates of different outside diameters which are welded together to form a composite work-piece that is thereafter forged into a generally dome-shaped base member
b. the periphery of the smaller metallic plate being inwardly spaced at all points from the periphery of the larger metallic plate
c. an annular portion extending outwardly from the generally dome-shaped base member and adapted to be welded at its outer end to a branch pipe
d. said annular outwardly-extending portion, including the terminus thereof being formed from the metal of both of the aforementioned circular metallic plates
e. that portion of the fitting which is adapted to be welded to the main tubular member being formed by the metal of the larger metallic plate only.

3,891,250
HOSE CONNECTION

Hans Oetiker, 21 Oberdorfstrasse, Horgen, Switzerland

Filed Jan. 2, 1973, Ser. No. 320,625
Claims priority, application Switzerland, Dec. 30, 1971, 19166/71
Int. Cl. F16l *33/00*
U.S. Cl. 285—242 31 Claims

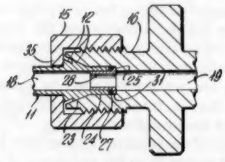


1. A connection between a hose and a tubular member having a mouth portion, which includes an enlargement on the tubular member near the mouth portion thereof as well as a closed, unbroken ring means which surrounds the hose, in turn surrounding the tubular member, and which presses the hose against the flank of the enlargement opposite the mouth portion, the movement of said ring means in the direction toward the mouth portion being limited by the hose within the area of said last mentioned flank, characterized in that a second enlargement is provided on the tubular member which is arranged remote from the mouth portion thereof, the ring means having an inner diameter which will pass over the end of the hose inward of the second enlargement and so sized that with the fluid flow of the material of the hose, the ring means will pass over the second enlargement but not over the first enlargement, the ring means, with an established connection, being disposed axially between the two enlargements, at least the inner surface of the ring means being approximately cylindrical and the inner diameter of the ring means being so selected that the ring means at least closely surrounds the hose with an established connection and is movable in the axial direction within the area of the second enlargement against the deformation resistance of the material of the hose.

3,891,251
SWAGED-TUBE COUPLING

Albert P. Richter, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,912
Int. Cl. F16l *19/02*
U.S. Cl. 285—338 2 Claims



1. A swaged-tube coupling including a coupling nut and comprising in combination,

a tube end having a swaged ferrule integrally formed on the exterior of said tube end and comprising a plurality of tapered protrusions located circumferentially around the tube end and having a flat radial surface spaced a predetermined axial distance from said end,

said coupling nut being situated on said tube end on the far side of said swaged ferrule from said tube end,

said nut having an integral flange extending radially inward forming a close fit over said tube end for contacting said ferrule against said flat radial surface,

a resilient-material O-ring having an inside diameter equal to the inside diameter of said tube end,

a cylindrical hollow sleeve supporting said O-ring and having an outside diameter less than the inside diameter of said tube end making a sliding fit therein,

an integrally formed flange on one end of said sleeve and extending outward so that the maximum diameter thereof is equal to the outside diameter of said tube end to accommodate said O-ring between it and said tube end, and a threaded fitting cooperating with said nut and having an inside diameter passageway equal to the inside diameter of said tube end,

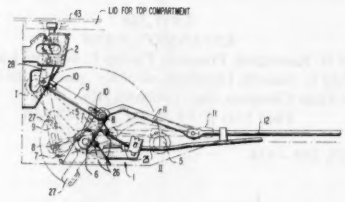
said threaded fitting having wall means defining a coaxial bore facing said tube end and forming a radial shoulder for contacting the outside of said sleeve flange, said passageway and said bore forming a passageway through said fitting,

said O-ring being axially between said tube end and the inside edge of said sleeve flange so that when said nut is tightened, said O-ring is squeezed into sealing engagement with said wall means and said tube end.

3,891,252
LOCK MECHANISM

Adolf Lehmann, Schonaich, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed May 30, 1974, Ser. No. 474,811
Claims priority, application Germany, May 30, 1973, 2327487
Int. Cl. E05c *5/00*
U.S. Cl. 292—6 20 Claims

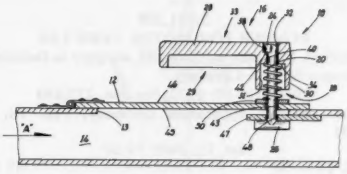


1. A closure and locking mechanism for a foldable top compartment lid of a compartment receiving a foldable top and for a fabric retaining member forming the rear termination of the foldable top, which includes a remote control means arranged in the passenger space of the vehicle, two locking means disposed opposite one another in the vehicle transverse direction for releasably locking the compartment lid and a lock means for the fabric retaining member, said locking means as well as said lock means being operatively connected with said remote control means for transfer into an unlocked position, characterized in that the remote control means includes a pivot shaft having two entrainment means, one of said entrainment means being operatively connected with the nearer locking means by way of a push rod means having elongated aperture guide means, the other entrainment means being operatively connected with a bell crank means and both the other more remote locking means as well as said lock means being operatively connected with said bell crank means.

3,891,253
DOOR HANDLE AND LATCH DEVICE

Alan E. Revell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 26, 1974, Ser. No. 509,665
Int. Cl. E05b *3/00*
U.S. Cl. 292—59 **10 Claims**



1. A combination door handle and latch device, comprising:

a. a latch portion comprising: a stem adapted to be received through a hole in a door to be latched; an arm connected to one end of said stem, said arm projecting generally transversely outwardly of said stem; and striker engaging means connected to the other end of said stem;

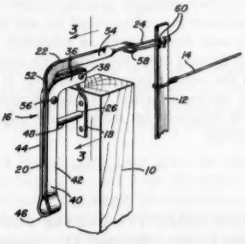
b. a handle portion comprising: a resilient means retaining pocket formed therein and one side of said handle portion; a latch stem receiving aperture formed therein and open to said pocket and cooperating therewith to form a resilient means abutment shoulder; a latch arm clearance notch formed in a wall of said stem receiving aperture and open to said pocket; a latch arm engagement cavity formed in a wall of said stem receiving aperture; and an arm abutment shoulder separating said cavity from said pocket; and,

c. resilient means disposed in said pocket between the door and said resilient means abutment shoulder to urge said handle portion generally away from said stem portion and cause said stem arm to move into said cavity and force said stem abutment shoulder against said stem arm.

3,891,254
WIRE GATE LATCH

Pleasant M. Lile, Box No. 38, 3536 Beecraft Ln., R.R. No. 2, Billings, Mont. 59101

Filed Jan. 11, 1974, Ser. No. 432,640
Int. Cl. E05c *5/00*
U.S. Cl. 292—113 **6 Claims**

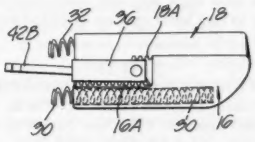


1. In combination with an upright post adapted to have one end of a wire gate drawn toward one side thereof, a wire gate latch comprising a bracket mounted from the upper end portion of said post and including an upper portion disposed slightly above the upper end of the opposite side of said post, a first inverted L-shaped lever disposed outwardly of said opposite side and including a short upper horizontal arm projecting toward said post at an elevation above the upper end thereof and a long lower upstanding arm extending downwardly along said post, the free end portion of said horizontal arm being pivotally supported from said upper bracket portion for swinging of said lever about a first axis generally normal to a plane containing said arms, a second horizontal L-shaped lever including a long horizontal leg disposed above and extending across the upper end of said post and a short upstanding leg projecting downwardly along said opposite side, means pivotally securing the free lower end of said short leg to the upper base end of said long arm adjacent said short arm for pivotal movement about a second axis generally paralleling the first axis and with said short leg defining an extension of the base end of said long arm and said long leg elevated at least slightly above, generally paralleling and extending beyond the free end portion of said short arm, said long leg and said bracket including coactive abutment means limiting swinging movement of the free lower end portion of said long arm toward said post to a position with said second axis swung slightly downwardly through a line extending between the free end of said long leg and said first axis, said long leg including anchor means on its free end remote from said short leg adapted for removable anchoring to said one end of said wire gate, the lower free end of said long arm being swingable outwardly and upwardly from said opposite side of said post and thereafter upwardly and inwardly over the upper end of said post to thereby shift said second axis over the top of said post toward said one side thereof.

3,891,255
DOOR LOCK ASSEMBLY

James A. Millett, 18143 Fivestone Ct., Fountain Valley, Calif. 92708

Filed Mar. 28, 1974, Ser. No. 455,576
Int. Cl. E05c *1/16*
U.S. Cl. 292—169.13 **6 Claims**

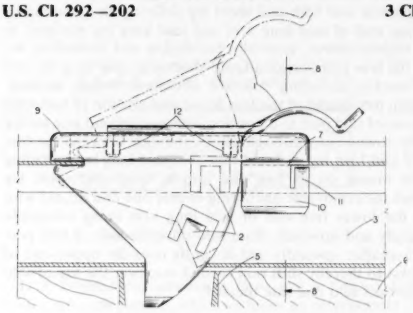


1. A latch bolt assembly comprising: a housing; a latch bolt slidable in said housing and having a toothed rack formed at the inner end thereof; a dead latch slidable in said housing adjacent said latch bolt and having a toothed rack formed at the inner end thereof in facing relationship with the toothed rack of said latch bolt; a carriage slidable in said housing and interposed between the inner end of the latch bolt and the dead latch; a pinion rotatably mounted on said carriage and engaging the toothed racks formed on said latch bolt and on said dead latch; a linkage member coupled to said carriage to move said carriage in said housing and thereby withdraw said dead latch and latch bolt from an extended position to a retracted position; a pawl formed on the outer end of said linkage member in position to engage the pinion in a ratchet relationship therewith to permit rotation of said pinion in one direction and to arrest rotation of said pinion in the other direction when the linkage member is released; and resilient means interposed between said linkage member and said carriage normally to bias said pawl into engagement with said pinion.

3,891,256
SELF-RETAINING LATCH WITH INSERT STRENGTHENER

Morris E. Johnson, Batavia, and Josef Princ, Glen Ellyn, both of Ill., assignors to Nichols-Homeshield, Inc., West Chicago, Ill.

Filed Jan. 17, 1974, Ser. No. 434,046
Int. Cl.[2] E05C 3/04
U.S. Cl. 292—202 3 Claims



1. A retention device for retaining a frame to a structure comprising a frame having a latch receiving slot and a plurality of apertures; an insert adapted to be coupled to said frame overlying said slot, said insert having a slot complementary to the latch receiving slot when coupled to said frame; retention means carried by said insert for coupling said insert to said frame, said retention means including an inwardly extending leg adapted to extend through said slot in said frame and a plurality of pin members projecting from said insert and offset from a center line of said insert, said pin members adapted to be received within said apertures in said frame; a latch pivotal about said frame member extending through said slot in said insert and said frame slot, adapted to engage a support structure whereby said latch and said insert coact to distribute force applied to said latch over an extended area.

3,891,257
ADJUSTABLE WOVEN ROPE ASSEMBLY

William P. Wilson, 2820 W. Fuller, Ft. Worth, Tex. 76133

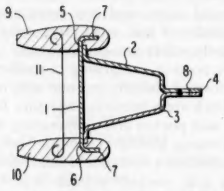
Filed Sept. 21, 1973, Ser. No. 399,616
Int. Cl. E05c 17/04
U.S. Cl. 292—262 6 Claims

1. An adjustable connector assembly comprising a flexible elongated rope of tubular braided construction having a free end, said free end adapted to be bent upon itself to form a loop intermediate the ends of said rope, said free end sequentially entering into and exiting from the interior of said tubular braided rope at spaced apart points along the length of said rope to define between each point of entrance and exit a lengthwise extending tubular sleeve comprised of the braids of the rope, said rope including at least two such sleeves spaced apart along its length spaced from said free end and an elongated tubular handle slidably threaded onto said rope between said sleeves.

3,891,258
BUMPER FOR MOTOR VEHICLES

Béla Barényi, Maichingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 17, 1972, Ser. No. 227,491
Claims priority, application Germany, Feb. 18, 1971, 2107701
Int. Cl. B60r 19/08
U.S. Cl. 293—98 37 Claims



1. A bumper for motor vehicles, especially for passenger motor vehicles, having a vehicle support structure with a front and rear end, the bumper being disposed beyond the respective ends of the support structure, the bumper comprising: at least one hollow profile member having upper and lower wall portions tapering in the direction of the vehicle support structure, said hollow profile member including a front wall portion having an approximately vertical smooth surface and extending between said upper and lower wall portions, a first web means provided on said profile member for mounting the same on the vehicle support structure, said first web means being disposed in a substantially horizontally extending plane and extending substantially over the entire width of the vehicle, a second web means provided on said front wall portion, said second web means being an extension of said front wall portion and spaced from said first web means in a direction away from the vehicle support structure, at least one protective profile means mounted on said second web means, and lateral parts provided on both lateral edges of said hollow profile member.

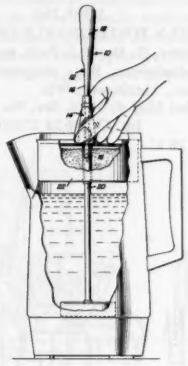
3,891,259
DEVICE FOR REMOVING COFFEE BASKET AND STEM

Vernon Dale Griffin, Midland, Tex., assignor to Chancellor Chair Company, Midland, Tex., a part interest

Filed Sept. 13, 1973, Ser. No. 396,692
Int. Cl. A47j 45/10
U.S. Cl. 294—33 6 Claims

1. A device for removing the coffee basket and stem from coffee making apparatus, said device comprising an elongated shaft, a manually flexible gripping sleeve mounted generally coaxially on and completely about said shaft, said sleeve having a first end engaged about and sealed to said shaft and a second enlarged end positionable about the perk stem of coffee making apparatus and selectively manually flexible into gripping engagement with the stem, said shaft projecting

through said sleeve to at least the second end of the sleeve, the shaft being selectively introducible into the upper discharge



end of a perk stem with the sleeve positioned in surrounding relation to said perk stem.

3,891,260

TONGS FOR USE IN A MULTI-STAGE FORGING PRESS

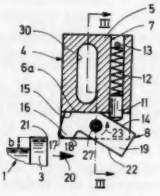
Hans Kuhn Basel, Switzerland, assignor to F. B. Hatebur A.G., Basel, Switzerland

Filed May 29, 1973, Ser. No. 364,479

Claims priority, application Germany, May 27, 1972, 2225878

Int. Cl. B66c *1/66*

U.S. Cl. 294—90 **6 Claims**



1. In a multi-stage forging press in which a forging having a collar projecting at right angles to the axis of the press and which is downstream relative to the direction of the ejection from the press is to be automatically transported by tongs, said tongs comprising:

a. a plurality of cooperating tong jaws for gripping and transporting a forging ejected from the press,

b. each tong jaw including a lever pivotably mounted at the jaw end face where the forging is gripped,

c. said lever having first and second arms arranged at an angle with respect to each other,

d. said lever being pivotable between an open position and a gripping position about an axis at right angles to said direction of ejection,

e. the lever being effective to pivot to the gripping position when the arm remote from the press is contacted by the forging being transported,

f. the position of the pivotal axis and the dimensions of the lever being effective to cause the arm remote from the press to engage the circumference of the collar and to cause the arm nearest the collar to engage a surface of the forging behind the collar.

3,891,261

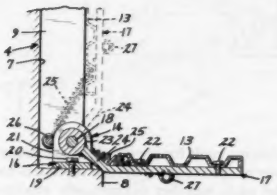
CATWALK FOR VEHICLE BOXES

Erwin F. Finneman, Anamoose, N. Dak. 58710

Filed Jan. 4, 1974, Ser. No. 430,648

Int. Cl. B62d *39/00*

U.S. Cl. 296—1 R **2 Claims**



1. A catwalk for vehicle mounted load carrying boxes having laterally spaced side walls, comprising:

a. an elongated catwalk element disposed adjacent one side wall of a vehicle box structure;

b. a plurality of longitudinally spaced hinges for mounting said catwalk element on the box structure for movements about a common generally horizontal axis extending parallel to the sidewall of the vehicle box structure between a generally vertically disposed inoperative storage position generally parallel to and engaging the sidewall and a generally horizontal load carrying position wherein the catwalk element projects laterally outwardly from the sidewall, said hinges each including:

1. a hinge bracket structure having a base portion adapted to be secured to a portion of the box structure and a pintle supporting portion projecting laterally from the base portion, said pintle supporting portion having an opening therethrough;

2. pintle means extending through said opening;

3. and a hinge plate having one end mounted on said pintle means for swinging movements relative to said hinge bracket structure, a plate-like portion for connection to said catwalk element, and a connecting portion between said plate-like portion and said one end, said connecting portion being disposed at an angle to the plane of said plate-like portion and disposed to engage a portion of one of said structures when mounted on the vehicle, to limit swinging movement of said catwalk element in a downward direction beyond said operative position thereof;

c. one of said hinges including a pair of anchoring elements one on its respective hinge bracket structure and the other on its respective hinge plate;

d. and a coil spring having opposite ends each connected to a different one of said anchoring elements;

e. said anchoring elements being so disposed on said hinge bracket structure and hinge plate relative to the axes of said pintle means that said anchoring element on the hinge plate moves through an over center relationship with said pintle means axis and the other of said anchoring elements during movement of said hinge plate and catwalk element between operative and inoperative positions thereof, whereby said spring yieldingly holds said hinge plate and catwalk element in said operative and inoperative positions.

3,891,262

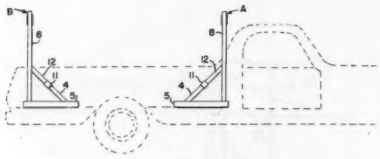
FOLDING CARRIER RACK FOR PICK-UP TRUCKS

John R. Brunel, 5887 Greenridge Rd., Castro Valley, Calif. 94546

Continuation-in-part of Ser. No. 309,368, Nov. 24, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,260

Int. Cl. B60p 3/00

U.S. Cl. 296—3 4 Claims



1. A folding rack for a pick-up truck comprising:

a. a pair of spaced parallel base members each consisting of a flat plate member permanently attached to the bed of said truck and a channel member having upturned flanges releasably connected to said flat plate;

b. holding means consisting of a plurality of load spreading members carried on the underside of said pick-up bed and a plurality of threaded bolts and nuts releasably connecting said base members to said load spreading members;

c. a pair of post members pivotally attached to said base members and movable from a first stored position, wherein they are substantially in a horizontal position, to a second load-carrying position wherein they are substantially in a vertical position;

d. bracing means constructed so as to fold within the upturned flanges of said base members including a first member pivotally connected at one end to said base member and connected at the other end in a rotatable connection to a second member which is attached at its other end in a pivotal connection to said post member;

e. means rigidly connecting said bracing members together in general alignment when said post members are in the second position; and f. a cross member connecting the upper ends of said post members forming a load-carrying elevated surface.

3,891,263

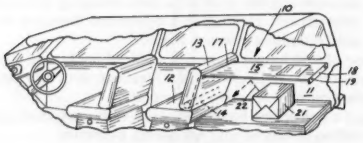
SAFETY SHIELD AND COMPARTMENTIZER

Joseph Orsulak, 1908 Carol St., Bossier City, La. 71010

Filed Jan. 14, 1974, Ser. No. 433,391

Int. Cl. B60r 21/02; B62d 33/04

U.S. Cl. 296—24 R 2 Claims



1. A safety shield and compartmentizer for mounting in a vehicle comprising:

a. A rotatably mounted spindle positioned in the seat back rest of said vehicle, said seat back rest being fitted with a longitudinal back rest slot across the width thereof;

b. A flexible panel, positioned in said seat back rest one end of which is attached to said spindle, said panel being adapted to selectively roll up on and retract from said spindle; and

c. Fastening means attached to the opposite end of said panel for fastening said panel to preselected areas of said vehicle.

3,891,264

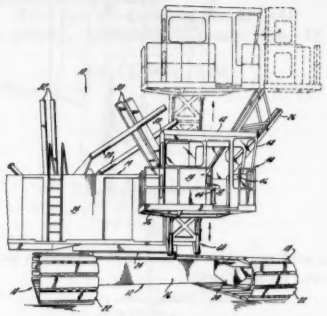
SELECTIVELY POSITIONABLE OPERATOR'S CAB

Charles A. Hunter, II; David J. Pech, and James G. Morrow, Sr., all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed May 6, 1974, Ser. No. 467,196

Int. Cl. B62d 27/00

U.S. Cl. 296—28 C 7 Claims



1. A support mechanism for a selectively positionable control module for a load handling device having a frame on which a movable, load handling boom is mounted comprising, in combination:

a subframe attached to the frame independent of the boom;

an articulated support having inner and outer members pivotally connected at their remote ends to said subframe and the control module, respectively;

means including a parallelogram linkage pivotally connected at its ends to said subframe and the control module, respectively, for maintaining said module substantially horizontally disposed as said support is raised, lowered and articulated;

means including a first linear actuator pivotally connected at one end to said subframe and at the other end to said inner member for raising and lowering said articulated support and control module as a unit; and,

means including a second linear actuator, a rocker arm and a link interconnecting said remote ends of said articulated support for folding said outer member and control module in and out with respect to said inner member, said rocker arm being interposed between said second actuator and said link and pivotally mounted on said inner member; whereby movement of said load handling boom may be controlled by a person operating controls in said control module.

3,891,265

FAIRING FOR ATTACHMENT TO THE HANDLEBARS OF A BICYCLE

James R. Blackburn, 2071 Rosswood Dr., San Jose, Calif. 95124

Filed July 1, 1974, Ser. No. 484,616

Int. Cl. B62j 17/00

U.S. Cl. 296—78.1 10 Claims

1. A wind screen fairing for attachment to the handlebars of a bicycle to protect the hands, torso and face of a bicycle rider, comprising:

a sheet comprised of a clear, flexible material and including a top edge and a bottom edge, each aligned in a substantially horizontal direction, and arranged such that a line bisecting said top and bottom edges defines a vertical reference line and a line passing through said sheet inter-

mediate said top and bottom edges and normal to said vertical reference line defines a horizontal reference line, said sheet further including first and second slots, respectively extending along said horizontal reference line from the respective side edges of said sheet inwardly toward one another, said sheet additionally including a first pair of apertures respectively disposed above and below said first slot and a second pair of apertures respectively disposed above and below said second slot; and

mounting means for aligning the apertures of said first pair and for aligning the apertures of said second pair and for securing said sheet to the handlebars, the respective alignments of said pairs of apertures being operative to produce a cross-curvature of said sheet along said horizontal reference line and said vertical reference line, bowing said sheet into a generally concave configuration, whereby said fairing provides a smooth outline and serves to protect the body of the bicycle rider.

3,891,266

ROOF FOR MOTOR VEHICLES

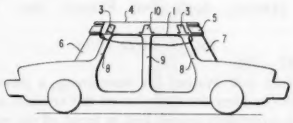
Karl Wilfert, Gerlingen-Waldstadt; Béla Barényi, Maichingen, and Hermann Renner, Magstadt, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 24, 1972, Ser. No. 309,357

Claims priority, application Germany, Nov. 26, 1971, 2158707; Nov. 27, 1971, 2158962

Int. Cl. B60q *3/00*

U.S. Cl. 296—137 R **66 Claims**



1. A roof for a motor vehicle comprising a roof structure means including a roof plate means for defining the upper extent of a vehicle interior space and a roof frame means including longitudinal girder means and cross girder means, said longitudinal and cross girder means being formed into said structure with said roof plate means with said longitudinal and cross girder means being on the exterior side of said roof plate means from said vehicle interior space, and separate cover plate means for separately covering the exterior of said structure of longitudinal and cross girder means, said separate cover plate means being movably secured to at least one of the roof plate means and the girder means.

3,891,267

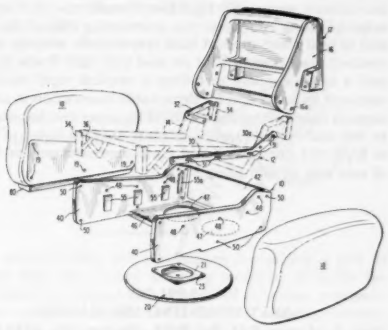
RECLINING CHAIR ASSEMBLY

William P. Taylor, Glencoe, Ill., assignor to Burris Industries, Incorporated, Lincolnton, N.C.

Filed Nov. 9, 1973, Ser. No. 414,594

Int. Cl. A47c *1/32*

U.S. Cl. 297—68 **28 Claims**



1. A reclining chair assembly comprising in combination, a seat, a backrest, and linkage means for supporting and moving the seat and backrest relative to each other between a normal or upright position and a inclined reclining position, a main frame for supporting the linkage means, said main frame including opposite sides and a cross piece interconnecting said sides, said sides having preformed apertures therein located at predetermined locations for securing said linkage means relative thereto, said linkage means having fastening areas adapted to be aligned with said apertures in said sides of the main frame, said linkage means including a pair of mounting links to be rigidly secured to the opposite sides of the frame respectively, said main frame further including abutments for supporting and locating said linkage means on the frame prior to securement thereto with said fastening areas aligned with said apertures in said sides of the main frame, said abutments projecting inwardly from inner surfaces of the opposite sides of said frame at elevations spaced below top surface portions of the frame to receive and position the mounting links below the top surfaces of the frame, said sides of the main frame further including a second number of apertures for securing arm rests thereto, and wherein there is further included a pair of arm rests adapted to be secured to said sides of the main frame through said second number of apertures therein.

3,891,268

RAMP ATTACHMENT FOR WHEEL CHAIR

A. Hadley Taylor, 37846 Sharpe Ave., Willoughby, Ohio 44094

Filed May 10, 1974, Ser. No. 468,745

Int. Cl. A47c *7/62*

U.S. Cl. 297—217 **6 Claims**

1. A ramp attachment for a wheel chair which has a frame supporting a seat at a predetermined height above a floor

support and having wheel means associated with said frame for moving said chair over said floor support and said frame including two generally parallel rigid frame members running from front to rear respectively at opposite sides of the chassis of said chair; the combination for use therewith of an elongated ramp having a width less than that of said seat and having a length not over a few feet; a ramp support base consisting of rod means of a length to just reach between said two quickly removable rigid frame members when said chair is in operating condition; two connecting means one at each end of said ramp support base respectively adapted to firmly connect said support base on said two rigid frame members; and a ramp support including a vertical rigid strut having means at its lower end for detachable connection to said ramp support base and having means at its upper end for attachment to one end of said ramp; said ramp support being of a length to hold said one end of said ramp approximately at the level of said seat of said chair.

3,891,269

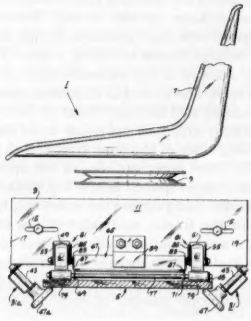
SEAT MOUNTING MECHANISM

Denis S. Moeser, P.O. Box 9108, Clayton, Mo. 63117

Filed Mar. 16, 1973, Ser. No. 341,876

Int. Cl. A47c *15/00*

U.S. Cl. 297—252 **23 Claims**



1. A mounting mechanism for a seat reciprocally movable along a flat surface comprising a support for said seat having wheels for rolling engagement on said surface, locking means selectively movable between a locking position in which said locking means concurrently releasably wngages at least one of said wheels and said surface to prevent movement of said support on said surface in one direction and a releaed position in which said locking means is not engaged with both said one wheel and said surface thereby to permit movement of said support along said surface in said one direction, said locking means comprising a roller normally biased toward the locking position and of a circumference substantially less than that of the wheel, and means for moving said locking means to said released position.

3,891,270

PNEUMATIC STOOL WITH FOOT REST CONNECTED TO SEAT BASE

Philip Edgar Crossman, and Richard Jerome Resch, both of Green Bay, Wis., assignors to Krueger Metal Products, Inc., Green Bay, Wis.

Filed May 10, 1974, Ser. No. 468,714

Int. Cl. A47c *3/30*

U.S. Cl. 297—347 **4 Claims**

1. A swivel stool comprising a base including a hollow cylindrical column, a pneumatic cylinder enclosed at its lower end within the upper end of said column, a flat retainer member for supporting the lower end of said pneumatic cylinder, at least two horizontal slots formed in said column for receiving and supporting said retainer member, a thrust bearing positioned between the upper surface of said retainer member and the lower end of said pneumatic cylinder, a mounting spider attached to the upper end of said pneumatic cylinder, and a seat attached to the upper side of said mounting spider and wherein a shaft extends downwardly from the lower end of said pneumatic cylinder, and wherein one side of said retainer member is forked to embrace said shaft.

3,891,271

SAFETY BELT SYSTEM

Walter Fieni, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed Jan. 10, 1973, Ser. No. 322,496

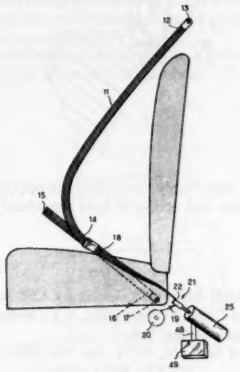
Claims priority, application France, Jan. 11, 1972, 72.00825

Int. Cl. A62b *35/00*

U.S. Cl. 297—386 **3 Claims**

1. A safety belt system for restraining a passenger in a vehicle upon sudden deceleration of the vehicle, comprising: a strap belt extending across and in front of the passenger; a stationary cylinder housing mounted in the vehicle; a piston rod and a piston operatively connected to said belt; said piston being movably mounted within said cylinder housing while said piston rod is rigid with said piston; a slidable connection between said piston and an intermediate portion of said belt; a slide member located within said housing and surrounding said piston rod, said slide member being connected between said piston and said connection to the belt; a ring frictionally mounted within said housing for displacement by said piston when the latter is moved forwardly, toward said connection, upon a sudden deceleration of the vehicle, and adapted to surround said slide member; spring means urging said slide member constantly backwards, away from said connection; and retaining means within said ring and in said slide member

for at least one ball initially lodged therein; wherein a backward rebound movement of said belt is prevented after the latter has reached its maximum degree of deformation, due to the backward movement of said slide member under the action of said spring means, while said ring remains in the forwardly displaced position, so that said ball wedges itself between said piston and said ring, while said piston rod remains stationary.



3,891,272

MOTOR VEHICLE SAFETY DEVICES

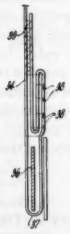
Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 157,562, June 28, 1971, Pat. No. 3,804,192. This application Jan. 16, 1974, Ser. No. 433,926

Claims priority, application Japan, July 14, 1970, 45-69730[U]; Aug. 27, 1970, 45-84724[U]; Oct. 6, 1970, 45-87139; Oct. 14, 1970, 45-90684

Int. Cl. A62b *35/00*

U.S. Cl. 297—386 **8 Claims**



1. A vehicle safety belt comprising a first elongated belt having an end section folded back along said belt and secured at its end portion to said belt to form a closed loop and means separable under a predetermined load joining longitudinally spaced portions of said belt end section to shorten the length of said belt end section forming a leg of said loop, said means separating under said predetermined load to permit the elongation of said loop without effecting the opening thereof.

3,891,273

AUTOMATIC WITHDRAWAL CONTROL MECHANISM FOR VEHICLE SAFETY

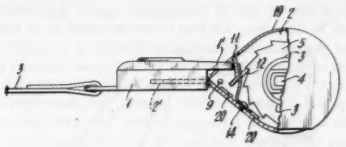
Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Sept. 10, 1973, Ser. No. 395,797

Claims priority, application Japan, Sept. 11, 1972, 47-090341

Int. Cl. A62b *35/00*

U.S. Cl. 297—388 **7 Claims**



1. A vehicle safety belt mechanism comprising a pair of separable first and second coupling members movable between relatively coupled and uncoupled positions, a retractable belt reel device connected to said first coupling member and including a spring biased belt retracting reel and a belt connected to said reel and withdrawable from and normally retracted by said reel and locking means mounted on said first coupling member and separate from said second coupling member and alternatively movable between a first position locking said belt against withdrawal from said reel and a second position releasing said belt and normally urged to said second position and means responsive to the coupled position of said coupling members and actuated by said second coupling member for transferring said locking means to said first position.

3,891,274

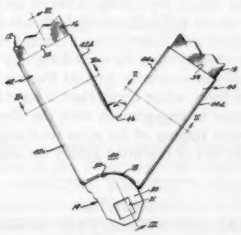
HOUSING FOR COMBINATION LAP AND SHOULDER BELTS

William J. Cook, Rockford, and Gordon A. Ellens, Grand Rapids, both of Mich., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Aug. 23, 1973, Ser. No. 390,888

Int. Cl. A62b *35/00*

U.S. Cl. 297—389 **11 Claims**



1. A protective grip and cover for the latch plate of a dual lap-shoulder safety belt comprising a flexible, one-piece, molded plastic tubular body having a tubular first leg and a tubular second leg; said legs being divergent from each other at an angle less than 90°; a latch plate receiving pocket common to both of said legs and forming the apex of said body; the end of said pocket opposite from said legs being open to provide an aperture through which a latch plate may be projected.

3,891,275
MOBILE MINE ROOF SUPPORT WITH MINING APPARATUS

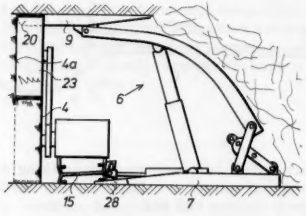
Kalus Spies, Dortmund-Wellinghofen, Germany, assignor to Bochumer Eisenhütte Heintzmann & Co., Bochum, Germany

Filed Nov. 26, 1973, Ser. No. 418,855

Claims priority, application Germany, Nov. 25, 1972, 2257828

Int. Cl.[2] E21D *17/08, 23/06*

U.S. Cl. 299—32 **12 Claims**



1. A mobile mine roof support for use in mine galleries of greatly different height, comprising elongated sole plate means arranged to rest on the floor of a mine gallery and having a front end directed to the face of the mine gallery and a rear end; a rear shield member having one end in the region of said rear end of said sole plate means and extending from said one end upwardly and forwardly towards the mine face; an elongated roof supporting cap member attached to the other end of said rear shield member pivotable about a pivot axis substantially parallel to said sole plate means, said cap member having a front end projecting forwardly beyond said front end of said sole plate means and adapted to be arranged closely adjacent to the mine face; extensible and collapsible prop means pivotally attached at opposite ends, respectively, to a portion of said sole plate means intermediate the ends of the same and to one of said member for pressing said cap member against the mine roof; means for pivotally and forwardly and rearwardly shiftable connecting said one end of said rear shield member to said rear end of said sole plate means so that regardless of the extension of said prop means, said front end of said cap member can be maintained closely adjacent to the mine face; elongated conveyor means extending transverse to said sole plate means and located between said front end of said sole plate means and the face of the mine gallery; moving means extending between and connected to said conveyor means and said sole plate means for moving said mine roof support and said conveyor means relative to each other toward and away from the mine face; and rigid extension means releasably connectable to said front end of said sole plate means to form, when connected, a rigid forward extension of the latter in engagement with the floor of the mine gallery to prevent tipping of the mine roof support under the pressure of the roof of the mine gallery on said cap member.

3,891,276
WHEEL AND WHEEL TRIM ASSEMBLY

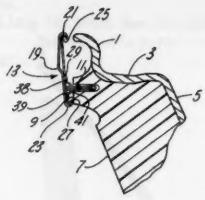
Edward G. Spisak, Westland, Mich., assignor to S & S Product Engineering Service, Inc., Wyandotte, Mich.

Filed Aug. 2, 1973, Ser. No. 386,389

Int. Cl. B60b *7/00*

U.S. Cl. 301—37 R **6 Claims**

1. A wheel structure comprising a tire receiving rim assembly having an outer radial flange and having an ornamental plastic portion attached thereto and extending radially adjacent said outer radial flange, said portion having an outer face provided with circumferentially extending groove means, said groove means also axially extending inward from the outer face of the portion, ornamental wheel time having inner and outer faces, a plurality of circumferentially spaced attaching finger means axially extending from the inner face into said groove means, said finger means having groove engaging



means thereon detachably contacting the opposite surfaces of the groove means and acting to hold the wheel trim attached to the portion.

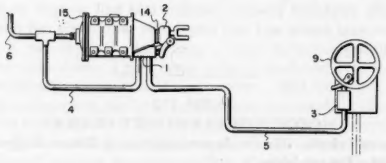
3,891,277
HAND BRAKE AUTOMATIC RELEASE ASSEMBLY

Geoffrey Wilton Cope, Williamsville, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 26, 1974, Ser. No. 509,622

Int. Cl.[2] B60T *7/00*

U.S. Cl. 303—2 **4 Claims**



1. A hand brake automatic release assembly for railway cars comprising an air brake cylinder having a pipe means at one end connected thereto for receiving air, and a reciprocable piston disposed at the other end, a normally closed actuating valve disposed adjacent the cylinder with means for opening the valve, said valve having an inlet and outlet with inlet and outlet conduits connected thereto, the inlet conduit communicating with the brake cylinder pipe means, the outlet conduit communicating with a hand brake release cylinder having a plunger extending therefrom for engagement with a hand brake release lever; upon application of air brakes, the normally closed actuating valve being opened by the opening means for only a finite portion of the piston travel permitting air from the pipe means and inlet conduit to pass through the actuating valve and outlet conduit to the hand brake release cylinder extending the plunger to operate the hand brake release lever thereby freeing the hand brake.

3,891,278
BRAKING SYSTEM WITH DUAL INDEPENDENT CIRCUITS

Albert Grosseau, Chaville, France, assignor to S. A. Automobiles Citroen, Paris, France

Filed July 2, 1973, Ser. No. 375,851

Claims priority, application France, July 3, 1972, 72.24395

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **8 Claims**

1. In a braking system for a vehicle having at least one wheel,

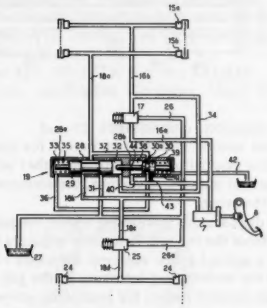
first and second brake actuator means, at least the first actuator means being arranged to brake the said wheel, first and second independent fluid circuits operative to

feed pressurized fluid to the first and second actuator means, respectively,

first valve means controlled in dependence on the dynamic state of the wheel and incorporated in the first fluid circuit, and

second valve means controlled in dependence on the pressure downstream of the first valve means, the second valve means being incorporated in the second fluid circuit and the second valve means being a quantity-regulating valve and comprising

a first movable member subjected to a control force determined by the pressure downstream of the first valve



means and to an opposing force determined by the pressure of fluid delivered by the second valve means, the first movable member being arranged to place the second actuator means in communication with the second fluid circuit or with a fluid outlet, according to the position of the first movable member, and

a second movable member controlled in dependence on the pressure of the first circuit upstream of the first valve means, and means controlled by said second movable member for locking said first movable member in a position to provide permanent free supply of fluid to the second actuator means when the said first circuit pressure upstream of the first valve means is zero.

3,891,279

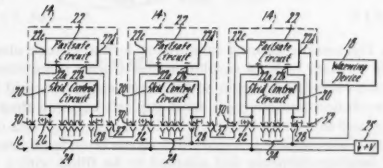
FAILSAFE SYSTEM FOR SKID CONTROL SYSTEMS AND THE LIKE

John S. Frait, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Oct. 19, 1973, Ser. No. 408,104

Int. Cl. B60t 8/00

U.S. Cl. 303—21 AF **18 Claims**



1. In a multi-axle wheeled vehicle having a plurality of skid control modules with each skid control module being operatively associated with one of the axles of the vehicle, each said skid control module comprising a skid control circuit means for skid controlling the wheels of the associated axle and first and second supply terminals to which first and second reference potentials are intended to be respectively supplied, and including supply means for supplying said first and second reference potentials, the invention wherein each said skid control module further includes a failsafe circuit means having an input terminal to which an input signal is intended to be supplied and an output terminal which is intended to supply an output signal, means for supplying an input signal to the input terminal of one of said failsafe circuit means, means for operatively coupling the output terminal of each preceding failsafe circuit means to the input terminal of the succeeding failsafe circuit means whereby an output signal from the failsafe circuit means of a preceding skid control module is supplied as the input signal to the failsafe circuit means of a succeeding skid control module, each said failsafe circuit means comprising means responsive to the presence of an input signal at its input terminal and the presence of the respective reference potentials at the respective supply terminals of its module for providing an output signal at its output terminal only when all of said input signal and said respective reference potentials are present, and warning means operatively coupled with the output terminal of failsafe circuit means of the last succeeding skid control module for providing a warning when an output signal does not appear at the output terminal of said last-mentioned failsafe circuit means so as to indicate when one of said input signal and said respective reference potentials is not present at any one of said failsafe circuit means.

3,891,280

DEVICE RESPONSIVE TO VEHICLE LOADING WITH SIGNAL GENERATING MEANS FOR BRAKE ACTUATION

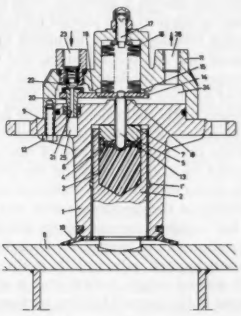
Lars Mattis Severinsson, Malmo, and Gert Artur Persson, Oxie, both of Sweden, assignors to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Nov. 28, 1972, Ser. No. 310,116

Claims priority, application United Kingdom, Dec. 4, 1971, 56416/71

Int. Cl. B60t 8/18

U.S. Cl. 303—22 R **2 Claims**



1. A device for transmitting a signal in response to an actuating force acting on the device such as weight of an object, comprising in combination, a housing, a piston movable in said housing, means transmitting said force to bear upon said housing and said piston to tend to move said piston in said housing as a function of the force, an enclosed plastic deformable body movable by said piston, a rod contacting said body to produce a movement thereby with said piston which is a function of said force, spring threshold means biasing said rod against said movement until said force exceeds a predetermined value overcoming the spring bias, and signal generating means actuated by movement of said rod, wherein said signal generating means comprises means supplying compressed air into a signal passageway for said compressed air in response to a valve member movable by said rod upon a movement of said piston by said actuating force, wherein said signal passageway includes a pressure chamber, and means controlled

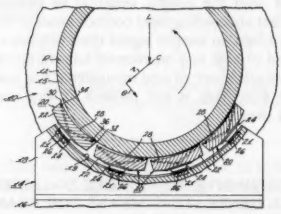
by movement of said rod to decrease pressure in said chamber when said force is at a predetermined value.

3,891,281

PIVOTED PAD BEARING APPARATUS AND METHOD FOR BIDIRECTIONAL ROTATION

Raymond C. Jenness, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 8, 1974, Ser. No. 459,119
Int. Cl. F16c 17/06
U.S. Cl. 308—1 R 10 Claims



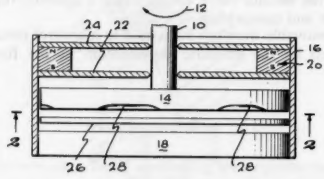
1. In combination, a rotatable journal, a pivoted bearing pad in supporting relation to said journal for bidirectional rotation, of said journal, stationary structure supporting said pivoted bearing pad for pivotal movement, said pivoted bearing pad including a journal bearing surface extending in a generally circumferential and also in a generally axial direction of said journal whereby to support said journal for bidirectional rotation, said journal bearing surface including opposite circumferentially spaced first and second edges, said first and second edges being respectively the leading and the trailing edges for one direction of rotation of said journal, said first and second edges being respectively the trailing and the leading edges for the opposite direction of rotation of said journal, said leading edge being at the circumferential end of said pivoted bearing pad first reached by a given point on the periphery of said journal for any given direction of rotation of said journal, said trailing edge being at the circumferential end of said pivoted bearing pad last reached by said given point for any given direction of rotation of said journal, said bearing pad including a pivotal support located substantially midway between said first and said second edges, a first and a second lubricant discharge means in the journal bearing surface of said pivoted bearing pad respectively contiguous but spaced from said first and said second edges, means effective on both directions of rotation of said journal for simultaneously connecting a supply of lubricant through substantially equal resistance flow paths to both said first and said second lubricant discharge means, the normal tilting movement of said pivoted bearing pad due to lubricant film development providing a larger clearance space between said bearing pad and the rotating journal contiguous the leading edge of said bearing pad for any given direction of rotation of said journal than contiguous the trailing edge for said given direction of rotation, whereby to provide a power frictional loss lubricant flow channel contiguous said leading edge for said given direction of rotation than contiguous the trailing edge for said given direction of rotation, and thus to promote substantially greater flow of lubricant through the lubricant discharge means contiguous said leading edge for said given direction of rotation than through the lubricant discharge means contiguous said trailing edge for said given direction of rotation.

3,891,282

LUBRICATED ASSEMBLIES

Robert H. Tuffias, Los Angeles, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 12, 1973, Ser. No. 424,087
Int. Cl.[2] F16C 7/04
U.S. Cl. 308—9 25 Claims



1. An assembly, comprising:

first and second elements mounted for relative rotational motion one with respect to the other selectively in one sense and the opposite sense, the elements forming a gap therebetween;

means displaceably positioned within the gap for separating, one from the other, a first space adjacent the first element and a second space adjacent the other element;

means for maintaining lubricant in the gap; and

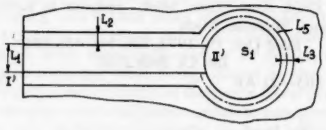
pressure control means for producing across the separating means a pressure drop whose orientation depends upon the sense of rotational motion, to thereby cause displacement of the separating means selectively toward the first element and toward the second element as a function of the sense of rotational motion.

3,891,283

SELF-FEEDING HYDROSTATIC

Francois C. Pruvot, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France

Filed Oct. 16, 1972, Ser. No. 297,737
Claims priority, application France, Oct. 18, 1971, 71.37334
Int. Cl. F16c 17/00
U.S. Cl. 308—5 R 4 Claims



1. Hydrostatic bearing comprising a first surface element being a rotary body of revolution and at least three identical bearing elements having a surface registering with said body of revolution and having a short gap left between their surfaces, and to which a relative speed tangent at all points of the first surface element is imparted, a recess bounded by each of said bearing elements and adapted to be filled with a fluid under pressure liable to leak between said first element and said bearing elements, said bearing elements constituting a sealing surface surrounding said recess, each bearing having said recess supplied with fluid under pressure from a thin-walled orifice at one end of a feed groove disposed in the direction of the relative motion between said first surface element and said bearing element, said groove being formed on each of said bearing elements and being of moderate width and relatively shallow in relation to the dimensions of said recess and bounded laterally by sealing surfaces pertaining to

said bearing element, said thin-walled orifice limiting the fluid output in said groove to a value lower than that of the fluid output normally carried along by the first sealing surface when the pressure in said bearing recess is equal to the supply pressure in said groove, said bearing elements being disposed preferably at spaced intervals around said body or revolution, the position of at least one of said bearing elements being adapted to be modified in relation to that of the other elements to permit the adjustment of the clearance left between said bearing elements and said body.

3,891,284

LONGITUDINALLY MOVING SHAFT BEARING

Horst Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Apr. 15, 1974, Ser. No. 461,244

Claims priority, application Germany, Apr. 17, 1973, 2319340

Int. Cl. F16c *29/06*

U.S. Cl. 308—6 C **21 Claims**

1. A ball bearing for journalling longitudinally moving shafts, axles or the like comprising a hollow cylindrical cage having an inner bore adapted to receive said shaft, said cage having a plurality of closed end ball guide paths uniformly spaced about its circumference, each guide being formed of at least one axial groove in which the balls are retained, said axial groove being open to the inner bore of the cage to engage the shaft therein and open to the outer surface of said cage, each axial groove having a rail located in the outer opening, said rail having a race surface engaging the balls in said groove, the rails for all of said grooves being interconnected at only one end to each other to form a cylindrical cover for said cage.

3,891,285

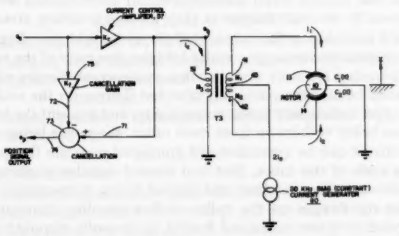
ELECTROSTATIC BEARING SENSING AND CONTROL CIRCUITRY

James L. Atkinson, La Mirada, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 13, 1974, Ser. No. 469,165

Int. Cl.[2] F16C *39/00*

U.S. Cl. 308—10 **5 Claims**



1. In an electrostatic suspension, force-rebalance type inertial instrument in which the suspension plates of the electrostatic bearing are further used in a capacitive bridge to provide inertial data read-out, non-magnetic circuit means for decoupling the force rebalance signal component and the inertial data signal components.

3,891,286

ROLLER BEARING ASSEMBLY

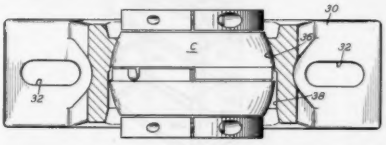
George A Zimmer; Charles M. Allaben, Jr., and William K. Weidman, all of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 267,307, June 29, 1972, abandoned.

This application Feb. 15, 1974, Ser. No. 443,079

Int. Cl. F16c *13/00*

U.S. Cl. 308—207 **6 Claims**



1. In combination with a housing adapted to be fixed to a support and having a central opening therethrough defined by an arcuate surface, a self-aligning roller bearing assembly comprising:

a pair of rows of rollers;

an inner race having a cylindrical opening for receiving and supporting a shaft;

said inner race having a pair of raceways, each having a conical surface for contact by the rollers of a row;

an outer race;

said outer race being formed of a pair of substantially like members welded together;

each member of said outer race having an interior raceway, each of said interior raceway having a conical surface for contact by the rollers of a row, and an outer arcuate surface engaging the arcuate surface of said housing opening to permit relative arcuate movement of said outer race members and said housing;

said bearing assembly being insertable and removable as a unit with respect to said housing opening, and being self-aligning by such relative movement of said outer race members and said housing to thus accommodate shaft misalignment with respect to said support.

3,891,287

SLIDING BEARING

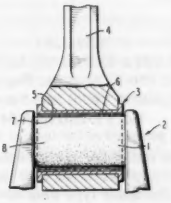
Ulrich Vogt, Reutlingen-Sondelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 13, 1973, Ser. No. 396,715

Claims priority, application Germany, Sept. 14, 1972, 2245039

Int. Cl. F16c *9/02*

U.S. Cl. 308—237 A **11 Claims**



1. A slide bearing which includes a bearing shell that is provided with a running layer of a soft bearing metal, in which

is journalled a pin of a shaft, characterized in that a thin layer of copper is applied over the pin.

3,891,288

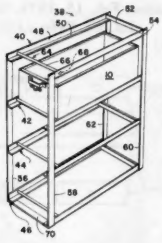
PLUG-IN EQUIPMENT SHIPPING CONTAINER AND RACK SYSTEM

John L. Marquette, 126 E. Green St., Westminster, Md. 21151

Filed Dec. 27, 1973, Ser. No. 428,731

Int. Cl.[2] B62B *05/00*

U.S. Cl. 312—338 **5 Claims**



5. A shipping container system comprising: a container having a bottom with upstanding interconnected left and right sides and front and back ends, a rack having structure defining a horizontal aperture therein proportioned to receive said container as a drawer inserted in the front of the horizontal aperture, said rack structure including: a horizontal support for receiving and holding the container at a predetermined level, guide means positioned for aligning the container during and after insertion of the container in the rack, a stop member located in position to limit rearward movement of the container when the container is fully inserted in the rack; a roller, means rotatably mounting the roller to the rack, said roller extending horizontally across the front of the horizontal aperture proximately in front of the fully inserted position of the container and proximately tangent at the lower circumference thereof to the level of the horizontal support, for thereby serving as a rolling support for the bottom of the container during insertion and for a retainer contacting the front end of the container after insertion, said container having a handle protrusive from each end thereof, each said protrusive handle comprising in plan view a straight portion and first and second spaced shanks extending from the container parallel with the sides thereof and connecting the straight portion with the container, and a one-hand disconnectable carrying handle in the form of a longitudinal grip extending the length of the container, first and second legs extending divergently downward at each end of the longitudinal grip, the end of each first leg turning outward and upward forming a hook proportioned for engagement with the first shank with the first leg inside the first shank, the end of each second leg turning inward toward said hook of the first leg; the divergence between said legs being proportioned for engaging the turned end of the second leg with the second shank on said engagement of the first leg with the first shank.

3,891,289

LOCKABLE ELECTRICAL OUTLET

Edward F. Hanke, 550 E. 33rd St., Eugene, Oreg. 97405

Filed Feb. 7, 1974, Ser. No. 440,397

Int. Cl. H01r *13/54*

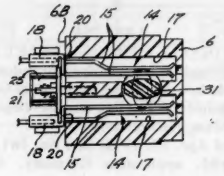
U.S. Cl. 339—14 P **2 Claims**

1. An electrical outlet for the lockable reception of both two and three prong plugs of the type associated with household appliances, the latter type plug having a ground prong, said outlet comprising,

a main housing defining multiple cavities each for the reception of contact finger assemblies, an internally threaded bore within said housing extending intermediate a pair of said cavities and terminating in communication with an additional cavity within the housing,

contact finger assemblies disposed within each of said cavities and adapted for engagement with the inserted prongs of an electrical plug,

a threaded locking member rotatably mounted within the housing bore and terminating outwardly of the housing in an exposed fingergrip, said locking member threaded for



a portion of its length, cam surfaces oppositely formed on said locking member for laterally biasing a pair of contact finger assemblies into positive contact with plug prongs, said locking member terminating inwardly in an end portion disposed within said additional cavity for biasing a ground contact finger against the ground prong of a plug whereby the plug prongs are frictionally engaged by each contact finger assembly and by a ground contact finger assembly to assure positive electrical contact and to prevent inadvertent plug separation from the outlet.

3,891,290

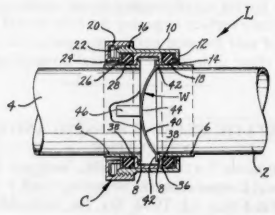
WASHER FOR ELECTRICALLY CONNECTING THE TUBES OF A FLUID LINE

Tommy G. Marshall, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 15, 1973, Ser. No. 406,540

Int. Cl. H01r *3/04;* **H02g** *15/08*

U.S. Cl. 339—15 **9 Claims**



6. In a fluid line for carrying a flammable fluid and including first and second metal tubes of circular cross-section having outwardly directed flanges at their ends, a coupling arrangement connecting the tubes at their ends, said coupling arrangement comprising: a collar bridging the ends of the tubes and having inwardly directed first and second flanges which extend behind the outwardly directed flanges on the ends of the first and second tubes, respectively, and prevent the tubes from being withdrawn from each other, the collar being split so that it can be expanded and emplaced over the flanges at the ends of the tubes; first and second annular elastomeric seals encircling the first and second tubes, respectively, behind the flanges on the collar; a first coupling element extended over the collar and having an inwardly disposed portion located behind the first seal with the first seal being between the first flange of the collar and the inwardly disposed portion of the first coupling element; a second coupling element having an inwardly disposed portion located behind the

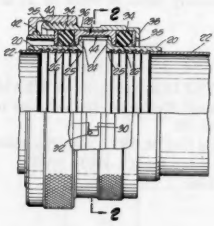
second seal element with the second seal element being disposed between the second flange of the collar and the inwardly disposed portion of the second coupling element, the coupling elements being threaded together with the axial spacing between the inwardly disposed portions of the coupling elements being decreased compressing the seal elements in the axial direction between the flanges of the collar and the inwardly disposed portions of the coupling elements; and a washer located within the collar, the washer being formed from a resilient electrically conductive material and being undulated, forming lobes, the lobes on the washer being in contact with the flanges on the ends of the tube electrically connecting the tubes.

3,891,291

TUBING COUPLING INCORPORATING BRIDGING CONDUCTOR

Clarence A. Nadsady, Downey, and Clifford D. Cannon, Lahabra, both of Calif., assignors to E. B. Wiggins, Inc., Los Angeles, Calif.

Filed Feb. 5, 1974, Ser. No. 440,084
Int. Cl. H01r *3/04;* **H02g** *15/08*
U.S. Cl. 339—15 **14 Claims**



1. In a coupling joining two tubing ends, each of which is equipped with a radial end flange, wherein the coupling includes annular retainer structure straddling the radial end flanges with said flanges being in confronting spaced relation mechanically interconnecting the two tubing ends,

an improvement electrically interconnecting the two tubing ends, comprising:

electrically conductive means inside the annular retainer structure and of a width extending between and contacting said spaced apart radial end flanges of the two tubing ends and serving as a conductor bridge between the two tubing ends.

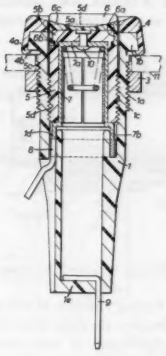
3,891,292

ELECTRICAL COMPONENT

Dennis Jack Blight; David Frederick Miller, and John Trevor Morgan, all of Enfield, England, assignors to Belling & Lee Limited, Enfield, England

Filed Sept. 24, 1973, Ser. No. 399,917
Claims priority, application United Kingdom, Sept. 26, 1972, 44451/72
Int. Cl. H01r *13/54*
U.S. Cl. 339—36 **11 Claims**

1. In an electrical component including a structural member having a stem portion and a flange portion extending radially outward from said stem portion to an outer edge and serving to locate said structural member in an aperture in a mounting panel the improvement comprising a removable cover member of insulating material for applying over said structural member of said component said cover member extending over said flange portion and formed with portions thereof extending over said outer edge of said flange portion and resiliently



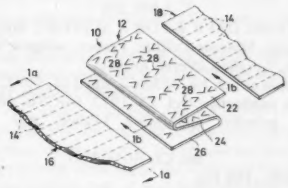
engaging beneath said flange portion to secure said cover member releasably thereon.

3,891,293

FLAT CABLE TERMINATING

Allan F. Jones, Milland, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 17, 1974, Ser. No. 470,812
Claims priority, application United Kingdom, June 21, 1973, 29501/73
Int. Cl.² H01R *11/20*
U.S. Cl. 339—97 C **4 Claims**



1. A method of terminating a flat cable having a plurality of parallel, spaced conductive tracks thereon covered with insulation comprising the steps of:

providing a termination device comprising a deformable flat metallic sheet bent to a U-shaped configuration providing a pair of flat spaced legs, said legs having generally parallel rows of barbs thereon, said rows being spaced apart a distance corresponding to the spacing of said conductive tracks;

inserting the end of said cable between said legs with said tracks aligned with said rows of barbs;

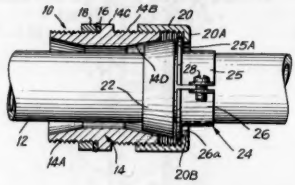
crimping said legs onto said cable end so that said barbs pierce said insulation and contact said conductive tracks; and

removing the metal of said termination device between said tracks to electrically isolate said tracks from each other.

3,891,294
CORD GRIP CONNECTOR

Robert A. Philibert, Burlington, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jan. 9, 1974, Ser. No. 431,827
Int. Cl. H01r 13/58
U.S. Cl. 339—103 R 2 Claims



1. An electrical fitting adapted to grip a cable or cord, comprising:

a connector body having threads at both of its ends;

a locking collar having threads adapted to engage with threads at the outer end of said connector body, said locking collar being provided with a radially inwardly directed flange and an opening in said connector body defined by said flange;

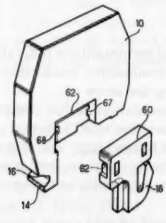
a clamping device adapted to be inserted within the interior of said locking collar from the outside, said clamping device being formed in two parts, semi-annular in shape, each of said parts having a radially outwardly extending flange adapted to engage the inner surface of the flange on said locking collar;

said clamping device being so shaped as to fit around a cable or the like and being provided with a pair of outstanding ears on each of the semi-annular parts, said parts being held in spaced relationship and being brought together so as to clamp said cable, each of the flanges on said clamping parts terminating in straight edge portions, the perpendicular distance between said edge portions at opposite ends of each of the respective flanges being less than said opening in the locking collar.

3,891,295
FIXING DEVICE FOR A SUPPORT MEANS

Jean Debaigt, Maisons-Laffitte, France, assignor to C.G.E.E.-Alsthom, Levallois-Perret, France

Continuation of Ser. No. 243,962, April 14, 1972, abandoned. This application Oct. 25, 1973, Ser. No. 409,669
Claims priority, application France, Apr. 15, 1971, 71.13295
Int. Cl. H01r 9/00
U.S. Cl. 339—198 GA 2 Claims

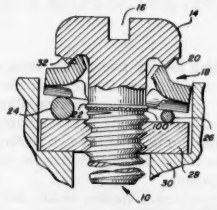


1. A terminal block assembly comprising, in combination: a channel-shaped metallic mounting bar having first and second opposed flanges; a plurality of stacked insulative support elements, arranged side by side, each having a base and upstanding first and second side and first and second end walls and an integral rigid projection depending beneath said first side wall, and a slot between said first side wall and said projection about each of which respective one of said insulative support elements have been rotated into assembly with said first flange of said mounting bar; a plurality of separate, removable, insulative bases assembled respectively with respective ones of said support elements and each base further including a flexible arm portion extending towards respective ones of said second side walls and diametric to associated ones of said slots, each said arm portion including a camming surface adapted to lock each respective said arm portion in engagement with said second flange of said mounting bar, wherein said plurality of stacked insulative support elements exceed numerically said plurality of insulative bases, some of said insulative support elements being free of insulative bases so as not to increase undesirably force required to engage fixedly said insulative support elements to said mounting bar whereby the plurality of stacked insulative support elements may be arranged in the form of a multiple block before being fixed onto the metallic mounting bar, each said support element including a recess in each said first end wall, wherein each of said bases is arranged to be inserted into said recess provided in respective ones of said first end walls, wherein each of said bases further includes interlocking means formed complementally to means provided in at least some of said recesses of each of said insulative support elements, and wherein said interlocking means comprises diametrically placed flexible latching tongues on each said base which engage complementary slots in walls of at least some of said recesses.

3,891,296
TEETER TERMINAL CLAMP

Charles E. Gutshall, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Filed Oct. 9, 1973, Ser. No. 404,805
Int. Cl. H01r 9/10
U.S. Cl. 339—246 9 Claims



1. A teeter terminal clamp for removably securing the terminal portion of at least one conductor comprising in combination:

a. a threaded shank having a head at one extremity and an entering end portion at the other extremity, said head being configured to cooperate with a tool whereby the shank may be rotated into or out of a threaded aperture, said head having an underhead surface with at least one, integral frustoconical section extending outwardly from said underhead surface concentric with the shank axis and between the inner and outer extremities of the underhead surface;

b. a clamping plate apertured to loosely and teeterably receive said shank, said plate having on the side adjacent said head a generally-annular inner section with inner surface flaring radially outwardly towards said head, a marginal outer section axially displaced from the head and radially displaced from the shank relative to said inner section, and a generally-frustoconical connecting section joining said inner and outer sections, said connecting section accommodating said frustoconical section

on the undersurface of said head whereby the extremity of said frustoconical section on the undersurface of said head registers with an intermediate portion of said connecting section when said frustoconical section on the undersurface of said head and said connecting section are aligned and in contact, said plate also having on the other side generally complementary inner, outer and connecting surfaces and including a plurality of spaced ribs extending radially from said connecting surface to the central aperture of said clamping plate so as to define the inner limits of the central aperture in said plate; said plate also having conductor-engaging, anti-slip surface irregularities on said other side thereof; and

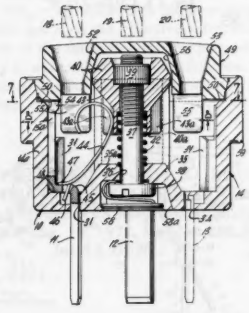
c. means for retaining said plate on said shank spacedly adjacent said head.

3,891,297

ELECTRICAL CONNECTOR FOR ATTACHMENT TO MULTI-CONDUCTOR CABLE

John M. Poliak, East Meadow, and Juan M. Lopez, New York, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Filed Apr. 10, 1974, Ser. No. 459,702
Int. Cl.[2] H01R 7/06
U.S. Cl. 339—270 R **10 Claims**



1. In an electrical connector for attachment to conductors of a multi-conductor cable, the improvement comprising:

a. a hollow connector body of insulating material;

b. said body having upstanding side walls defining a cavity;

c. a plurality of electrical contacts mounted in said cavity in spaced relation to each other;

d. each of said contacts having a terminal portion located within said cavity and extending lengthwise along one of said side walls of the body;

e. means for clamping bare ends of several conductors of a cable in electrical engagement with said terminal portions of said contacts;

f. said means including spaced clamping members rockably mounted within said connector body and having resilient and compressible free ends opposing wire-engaging faces of said terminal portions of the respect contacts;

g. a wiring insert mounted in said cavity for axial movement therein;

h. a plurality of spaced cams carried by said insert and engaging with each of said free ends of the clamping members;

i. said cam members being adapted to urge the free ends of the clamping members toward the wire-engaging faces and into compressive clamping engagement with the bare ends of the wires in movement of the insert in one direction relative to said body;

j. threaded means extending into said body and threadably engaging with said insert for moving said insert axially relative to said body; and

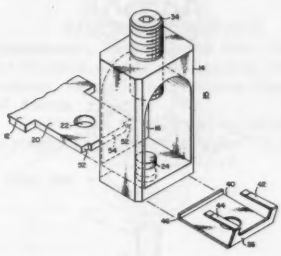
k. stop means located within said cavity for engaging with and limiting movement of the insert in said one direction.

3,891,298

CLIP CONNECTED TERMINAL LUG

Nick Yorgin, Ambridge, and Alfred E. Maier, both of Beaver Falls, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1973, Ser. No. 398,022
Int. Cl. H01r 7/12
U.S. Cl. 339—272 R **14 Claims**



1. A terminal lug for connecting an electric cable conductor to an electric bus conductor comprising:

a body member being generally rectangular shaped and having a passage formed therethrough in which a portion of the electric bus conductor and a portion of the electric cable conductor are to be disposed;

a boss formed in the passage of said body member for engaging the electric bus conductor portion which is disposed in the passage of said body member;

spring means for maintaining said boss in engagement with the electric bus conductor and for fastening the terminal lug to the electric bus conductor;

a terminal screw passing through the top end of said body member for forcing the portion of the electric cable conductor disposed in the passage of said body member into good electrical contact with the portion of the electric bus conductor disposed in the passage of said body member;

said spring means comprises a lug clip having a generally U-shaped cross sectional area and being constructed from a spring metallic material;

said lug clip disposed so that one leg of the U-shaped lug clip extends into the passage of said body member above the portion of the electric bus conductor disposed in the passage and the other leg of the U-shaped lug clip extends over the outside end of said body member to hold the portion of the electric bus conductor which is disposed in the passage formed in said body member against the inner surface of the passage at one end of said body member; the portion of the electric bus disposed in the passage is flat and has an opening formed therethrough;

said boss formed in the passage of said body member projects into the opening formed through the electric bus which in cooperation with said U-shaped lug clip secures said terminal lug to the electric bus conductor and prevents any substantial movement of the terminal lug with respect to the electric bus conductor;

the leg of the U-shaped lug clip which is disposed against the outside end of said body member being flat and slightly longer than the width of the end of said body member;

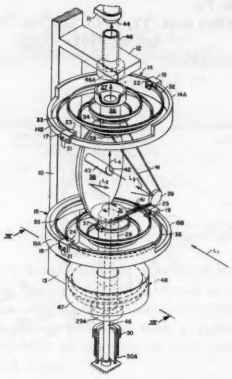
a lip formed at the free end of the outside leg of said U-shaped portion; and,

said lip extending over the end of said body member and engaging a portion of one side of said body member to tightly hold said U-shaped lug clip in place.

3,891,299
BEARINGLESS OSCILLATING SCANNER

Frank C. Rushing, Columbia, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 3, 1972, Ser. No. 294,731
Int. Cl. G02b 17/00
U.S. Cl. 350—6 9 Claims



1. A bearingless oscillating scanner of the type for scanning a scene, comprising:

a stationary sensor for producing a signal in response to energy rays having varying energy levels,

multiple mirror means positioned for receiving said rays from a scene and directing such rays to a pathway leading to said sensor,

a mirror support structure carrying said multiple mirror means and arranged for oscillation about a predetermined axis aligned with said pathway,

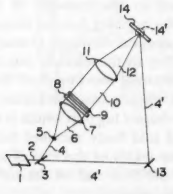
a stationary member,

a plurality of spring means arranged at axially-spaced-apart locations along said predetermined axis, each of said spring means being interconnected between said stationary member and said mirror support structure in a manner to provide an elastic restoring force to said mirror support structure when displaced during oscillation, and drive means for delivering oscillation-sustaining torque forces intermittently to said mirror support structure.

3,891,300
APPARATUS FOR MAKING HOLOGRAM

Yoshito Tsunoda, Hachioji, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 5, 1973, Ser. No. 394,439
Claims priority, application Japan, Sept. 9, 1972, 47-90788; Sept. 22, 1972, 47-94534; Jan. 24, 1973, 48-9507
Int. Cl. G02b 27/38
U.S. Cl. 350—3.5 15 Claims



1. An apparatus for making a Fourier transform hologram, comprising

a. a light source for producing a coherent light beam;

b. a source of analog picture information to be recorded as a hologram;

c. means for directing a part of the light beam to the analog picture information source;

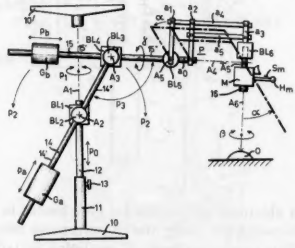
d. means for causing interference between the output light of the analog picture information source and another part of the light beam on a light sensitive medium; and

e. a phase shifting plate disposed in the vicinity of the picture information source in which at least two kinds of unit phase-change-giving regions having different thicknesses are distributed irregularly and discontinuously with a pitch lower than the resolution of the human eye on a transparent substrate for varying the phase of the output light of the analog picture information source irregularly.

3,891,301
ADJUSTABLE SUPPORT OR STAND FOR AN OPTICAL OBSERVATION INSTRUMENT

Rudolf Heller, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Continuation of Ser. No. 379,194, July 13, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,539
Claims priority, application Switzerland, Aug. 18, 1972, 12251/72
Int. Cl. G02b 23/16
U.S. Cl. 350—85 4 Claims

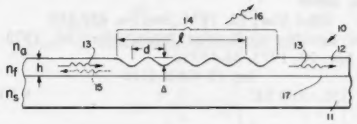


1. Adjustable stand for an optical observation instrument, the position and orientation of which can be freely adjusted and fixed in a spatial area, comprising an observation instrument, an instrument carrier for having the observation instrument affixed thereto, a stationary support, an elongated balance beam having a fulcrum defining two arms and supported at its fulcrum on the stationary support by means of two first blockable bearings having respective vertical and horizontal converging axial directions, one arm of the balance beam being equipped with a first adjustable compensation weight, an elongated intermediate member having a fulcrum defining two arms and supported at its fulcrum on the other arm of the balance beam by means of two second blockable bearings having respective axial directions converging and oriented transversely to each other, one axial direction being horizontal and the other being oriented substantially lengthwise to the intermediate member, one arm of the intermediate member being equipped with a second adjustable compensation weight while the instrument carrier is supported on the other arm of the intermediate member by means of an articulated rod arrangement.

3,891,302
METHOD OF FILTERING MODES IN OPTICAL WAVEGUIDES

Franklin Winston Dabby, Ewing Twsp., and Ami Kestenbaum, East Windsor Twsp., Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,731
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **32 Claims**



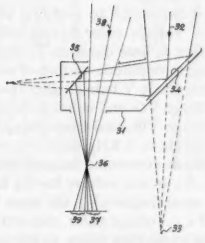
1. A method of mode filtering light of a given frequency propagated through an optical waveguide having a refractive index n_f in a first portion of a cross section thereof and a refractive index n_s in a second portion of the cross section, where $n_f > n_s$, which comprises:

selecting and providing variation in a region of the optical waveguide extending along the propagation axis of the waveguide to divert an unwanted mode of the light from forward propagation, the period of the variation being less than $\lambda/n_e - n_s$, where λ is the free-space wavelength of the light and n_e is the effective refractive index in the waveguide of the unwanted mode, the periodic variation extending to at least a portion of the cross section of the waveguide where the field of the unwanted mode substantially exists.

3,891,303
COMBINED SYSTEM OF OPTICAL DEVICES FOR PHOTOGRAPHY AND STEREOSCOPIC VISION

Joaquin Gomez Barquero, 23, Madrid-8, Ibiza, Spain

Filed Aug. 14, 1972, Ser. No. 280,553
Int. Cl. G02b *27/24*
U.S. Cl. 350—132 **2 Claims**



1. An attachment for use with photographic, television and cinema cameras that simultaneously produces in a unit frame a pair of transposed stereographic images from light reflected by an object, which images can be photographed, televised, or cinematographed with conventional equipment, said attachment comprising:

a housing adapted for mounting at the front of the camera, said housing having two horizontally spaced front apertures for the receipt of the pair of light images and a rear aperture for transmitting said images into the object lens of the camera;

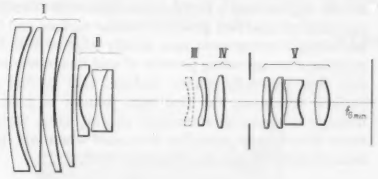
first mirror means mounted at an angle within said housing at the right of the front aperture for reflecting the light image received through the right aperture of said pair of front apertures toward the interior of the housing at substantially a right angle to the entering image; and

second mirror means mounted at the left side of said housing at an angle with respect to said first mirror means for reflecting light inciding from said first mirror means to the left half of said rear aperture, the light image entering at the left aperture of said pair of front apertures crossing the light image reflected from said first mirror means within said housing and passing directly through the right half of the rear aperture without deviation, rotation or inversion of the light image whereby the right image is displayed at the right side of the film plane of the camera and the left image is displayed at the left side of the film plane.

3,891,304
PANCRATIC OBJECTIVE

Trude Muszumanski, Vienna; Gunter Kurz, Voesendorf, and Irngard Wendisch, Vienna, all of Austria, assignors to Karl Vockenhuber, Vienna 18 and Raimund Hauser, Vienna 4, both of, Austria

Filed Jan. 12, 1973, Ser. No. 323,093
Claims priority, application Austria, Jan. 13, 1972, 282/72
Int. Cl. G02b *15/16*
U.S. Cl. 350—184 **4 Claims**



2. A varifocal objective comprising a positively refracting rear lens group and an afocal front lens assembly of variable magnification ratio, satisfying the relationship $f_{II} > f_{Gmin} - 6y$, f_{Gmin} being the minimum overall focal length of the objective and $2y$ being its image diagonal, said afocal lens assembly including:

a positive first component consisting of four air-spaced singlets each having a forwardly convex surface, all but the first of said singlets being positively refracting;

axially shiftable negative second and third components, f_{II} being the individual focal length of said second component; and

an axially fixed positive fourth component;

said first, second, third and fourth components and said rear lens group having individual focal lengths f_I, f_{II}, f_{III}, f_{IV} and f_V, respectively, of substantially the following numerical values referred to a mean focal length of numerical value unity:

$f_I = +2.168$
$f_{II} = -0.600$
$f_{III} = -2{:}093$
$f_{IV} = +1.237$
$f_V = +1.030$.

3,891,305
APPARATUS FOR SIMULATING A THREE-DIMENSIONAL IMAGE BY USE OF PLURAL IMAGE PRODUCING SURFACES

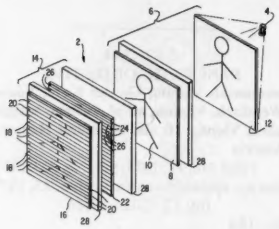
Lester Fader, 1402 Bardstown, Ann Arbor, Mich. 48105

Filed May 8, 1973, Ser. No. 358,322
Int. Cl. G02b *27/22*
U.S. Cl. 350—144 **16 Claims**

1. Apparatus for producing a pseudostereoscopic light image when viewed from a predetermined viewing area, comprising

a. first image producing means for directing a first light pattern corresponding to said image toward the viewing area, said first image producing means including a first generally planar surface having said image permanently recorded therein, and

b. second image producing means for directing a second light pattern toward the predetermined viewing area, said second image producing means including a second generally planar surface positioned forward of, parallel to and in axial alignment with said first generally planar surface,



said second generally planar surface including at least one portion of said image permanently recorded in an area axially aligned with a corresponding portion of said image recorded on said first generally planar surface and further including a transparent area axially aligned with the remaining corresponding portion of said image recorded on said first generally planar surface, said second planar surface permitting the first light pattern to pass therethrough to said predetermined viewing area, whereby a three dimensional sensation is created when said first and second patterns are visually integrated.

3,891,306

METHOD FOR DRIVING LIQUID CELL DISPLAY PANEL

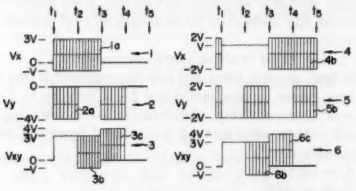
Isamu Mitomo, Hachioji; Tetsunori Kaji, and Masakazu Fukushima, both of Kokbunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 20, 1973, Ser. No. 381,003

Claims priority, application Japan, July 21, 1972, 47-73119

Int. Cl. G02f *1/28*

U.S. Cl. 350—160 LC **6 Claims**



1. A method for driving a liquid cell display panel including a plurality of first electrodes arranged in parallel to each other, a plurality of second electrodes respectively intersecting with each of said first electrodes and arranged in parallel to each other, and liquid cells of nematic type disposed at the respective intersections of said first electrodes with said second electrodes, said method comprising the step of applying a voltage to a predetermined liquid cell of said liquid cells through said first and second electrodes to drive said predetermined liquid cell, wherein said voltage includes a DC voltage and a high frequency voltage superimposed thereon during periods of two types of semi-selection of said liquid cell and said voltage includes at least a DC voltage during a period of full selection thereof, an amplitude ratio of said high frequency voltage to DC voltage during the period of at least one of said two types of semi-selection being in the range of at least 1 and not more than 2.

3,891,307

PHASE CONTROL OF THE VOLTAGES APPLIED TO OPPOSITE ELECTRODES FOR A CHOLESTERIC TO NEMATIC PHASE TRANSITION DISPLAY

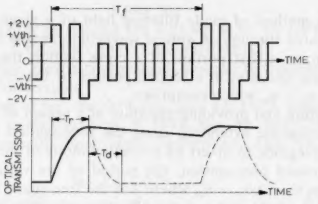
Masahide Tsukamoto, and Tetsuro Ohtsuka, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 12, 1974, Ser. No. 450,450

Claims priority, application Japan, Mar. 20, 1973, 43-32308; Apr. 20, 1973, 48-45332

Int. Cl. G02f *1/16*

U.S. Cl. 350—160 LC **9 Claims**



1. An electro-optical device comprising:

1. a liquid crystal cell having a first electrode and a second electrode for appling a voltage ot a liquid crystal layer between said first and said second electrodes and having a threshold voltage Vth above which its optical transmission changes, at least one of said first and second electrodes being light-transparent, said liquid crystal being cholesteric liquid crystal having positive dielectric anisotropy and consisting of nematic liquid crystal of 30 to 99 weight % having positive dielectric anisotropy and a compound of 70 to 1 weight % selected from steroidal compounds and optically active compounds; and

2. a means for changing optical transmission of said liquid crystal cell, comprising;

a. a first circuit connected to said first electrode which generates a.c. voltage pulse having amplitude v, frequency *f*, phase ϕ_1 time duration T_1 and d.c. bias voltage of the same amplitude as that of said a.c. voltage pulse, said amplitude V being higher than a half of said threshold voltage Vth and equal to or lower than said threshold voltage Vth, said frequency *f* being within a range from 10 Hz to 1 KHz, and

b. a second circuit connected to said second electrode which generates an a.c. voltage having the same amplitude V, the same frequency *f*, the same bias voltage as those of said a.c. voltage pulse, respectively and phase ϕ_1 switchable to another phase ϕ_2 for time interval T_2, said time interval T_2 being varied from O to T_1 for changing the optical transmission, whereby, an a.c. bias resulted from the difference between said d.c. bias voltage generated by said first circuit and said a.c. voltage generated by said second circuit keeps an excited light-transparent state of said liquid crystal cell and reduces fliker.

3,891,308

ACOUSTOOPTIC MODULATOR

Joseph D. Hawkins, Los Altos, Calif., assignor to Liconix, Mountain View, Calif.

Filed Aug. 5, 1974, Ser. No. 494,491

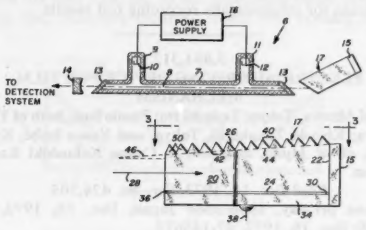
Int. Cl. G02f *1/28*

U.S. Cl. 350—161 **15 Claims**

1. An acoustooptic modulator for modulating a light beam comprising:

an acoustooptic body having a first planar surface and a second surface opposite and effectively nonparallel to said first surface, said second surface having scores therein; and

an acoustooptic transducer coupled to said first surface for transmitting an acoustic wave into said body through said



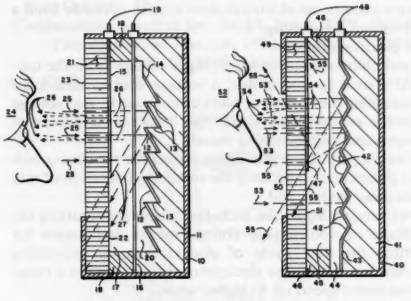
first surface for propagation to said second surface, said scores randomizing the reflection component of said acoustic wave from said second surface for preventing said reflection component from destructively combining with the forward propagating component of said acoustic wave.

3,891,309

REFLECTIVE ALTERABLE STATE MATERIAL DISPLAY

Ulrich Bonne, Hopkins, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 19, 1973, Ser. No. 426,173
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 R **29 Claims**



1. A display device containing therein an alterable state material capable of having a material state thereof selectively altered locally to thereby alter, at that location, scattering properties of said alterable state material with respect to impinging light, said device comprising:

a transparent wall having a transmitting surface therein;

reflecting surface means joined substantially across its surface to a first electrode by a solid body extending therebetween and exposed to said light passing through said transmitting surface, said reflecting surface means reflecting that light which has passed substantially perpendicularly through said transmitting surface to impinge on said reflecting surface means from an incident direction in directions other than said incident direction; and

said alterable state material disposed between said transparent wall and said reflecting surface means so that light in passing perpendicularly through said transmitting surface to impinge on said reflecting surface means also passes through said alterable state material.

18. A display device containing therein an alterable state material capable of having a material state thereof selectively altered locally to thereby alter, at that location, scattering properties of said alterable state material with respect to impinging light, said device comprising:

a transparent wall having a transmitting surface therein;

reflecting surface means, serving also as a first electrode, exposed to said light passing through said transmitting surface, said reflecting surface means reflecting that light which has passed substantially perpendicularly through said transmitting surface to impinge on said reflecting surface means from an incident direction in directions other than said incident direction; and

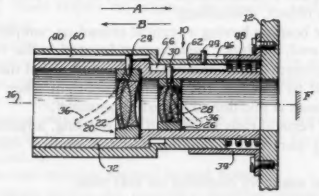
said alterable state material disposed between said transparent wall and said reflecting surface means so that light in passing perpendicularly through said transmitting surface to impinge on said reflecting surface means also passes through said alterable state material.

3,891,310

MACRO FOCUSING DEVICE FOR VARIABLE FOCAL LENGTH LENS

Hirokawa Hideo, Tokyo, and Mizuki Yoshiaki, Iruma, both of Japan, assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 8, 1974, Ser. No. 440,910
Claims priority, application Japan, Feb. 9, 1973, 48-17782
Int. Cl.² G02B *7/10*
U.S. Cl. 350—187 **6 Claims**



1. In a lens mount for a variable focal length objective lens defining an optical axis and being capable of close focusing relative to a camera housing, the lens having a variator lens cell and a compensator lens cell, the improvement comprising:

a barrel fixed to the camera housing and having first and second cam slots formed therein;

an operating sleeve arranged for rotational and axial movement relative to the optical axis for causing focal lenght varation by simultaneous adjustment of said variator and compensator lens cells and close focusing by adjustment of said variator lens cell alone including:

an elongated groove for driving said variator lens cell relative to said barrel upon rotation when said sleeve is in either a first axial position for focal length variation or a second axial position for close focusing;

an elongated groove for driving said compensator lens cell relative to said barrel upon rotation when said sleeve is in said first axial position;

the variator lens cell having a guide pin cooperating with one of said cam slots in said barrel and one of said elongated groove in said sleeve; and

the compensator lens cell having a guide pin cooperating with another of said cam slots in said barrel and another of said elongated grooves in said sleeve;

the sleeve further including:

a relief groove for selectively receiving said guide pin of said compensator lens cell when said sleeve is in one of said axial positions so that only said variator lens cell is driven axially in said barrel upon rotation of said sleeve.

3,891,311

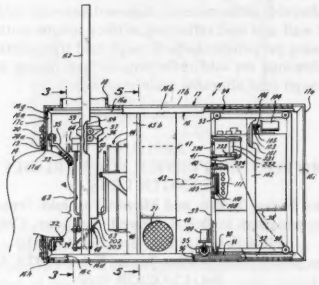
MULTIPARAMETER VISION TESTING APPARATUS

James C. Fletcher, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of Stacy R. Hunt, Jr., King of Prussia; Robert J. Homkes, Willow Grove; Wilmer B. Poteate, West Chester, and Andrew C. Sturgis, Exton, all of Pa.

Continuation of Ser. No. 160,371, July 7, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,495

Int. Cl. A61b 3/00

U.S. Cl. 351—38 12 Claims



1. A multiparameter vision tester for measuring a plurality of physiological characteristics of the eyes and visual system of a human object, comprising:

a box-like housing having a vertical extending compartment at one end, a subject viewing port located in the vertical compartment end of said housing, means about the viewing port to maintain the housing light-tight when a subject's head is positioned in testing position;

a pair of vertical rails located in the housing, adjacent the viewing port and extending into the vertical compartment;

an optical assembly mounted on said rails;

means to move said optical assembly along said vertical rails to position the optical assembly in the subject's line of sight and out of said line of sight into the vertical compartment;

a pair of horizontal rails located in the housing and extending along the bottom wall, thereof;

a carriage mounted on said horizontal rails;

means to move said carriage along said horizontal rails;

a pair of vertical rails in said carriage;

a film cassette unit having a screen mounted on said vertical carriage rails;

means to move said film cassette unit along said vertical carriage whereby the screen of said film cassette unit is alignable with the subject's line of sight through the optical assembly;

projector means to selectively provide a variety of different visual targets on said screen;

visual depth perception testing means formed of a Dolman rod assembly located on top of the film cassette unit, the Dolman rod assembly being alignable with the subject's field of view during testing for depth perception by vertical movement of the carriage, and means for manipulating said Dolman rod assembly;

means within the housing for determining the visual critical fusion frequency of the subject said visual critical fusion frequency testing means including the screen of said film cassette unit and a signal generator cooperatively associated therewith to project signals onto the screen;

field mapping means pivotally mounted on a structure within the forward end of the housing for mapping the visual field of the subject, said means stowable in a position out of the field of vision and moveable into the field of vision when the optical assembly is in the vertical compartment and field mapping is being performed;

control means for selectively performing the tests including electrical circuitry and energizing means cooperatively associated with all of said testing means for moving the selected testing means into the selected test configuration; and

tabulating means cooperatively associated with the testing means for automatically recording test results.

3,891,312

ELECTRICAL DRIVING DEVICE FOR FILM MECHANISM

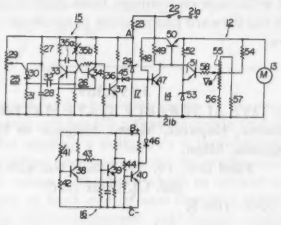
Hiroshi Aizawa, Tokyo; Tadashi Ito; Fumio Itoh, both of Yokohama; Kiyoshi Takahashi, Tokyo, and Yasuo Isobe, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Dec. 14, 1973, Ser. No. 424,705

Claims priority, application Japan, Dec. 18, 1972, 47-127425; Dec. 18, 1972, 47-145677

Int. Cl. G03b 21/48

U.S. Cl. 352—180 11 Claims



1. For a camera, an electrical drive system operable from a current source comprising:

a. an electromotor;

b. a switching means for supplying a voltage from the current source to said motor; a voltage control means for controlling the voltage of said current source, said voltage control means being connected between said current source and said switching means;

c. a rectangular wave generating means for producing output pulses and controlling the switching operation of said switching means; and

d. speed regulating means including means for adjusting the voltage of said voltage control means and means for setting the duty cycle of said rectangular generating means for driving the electromotor freely within a range from lower speed up to higher speed.

3,891,313

STEREO ACCESSORY FOR PROJECTORS

Gregory I. Murphy, 4042 Phoenix St., Concord, Calif. 94521

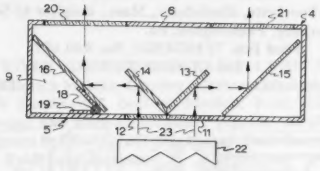
Continuation-in-part of Ser. No. 375,539, July 2, 1973, abandoned. This application Sept. 14, 1973, Ser. No. 397,226

Int. Cl.[2] G03B 21/00, 35/18; G02B 27/26

U.S. Cl. 353—8 1 Claim

1. A stereo accessory for a projector comprising (a) a housing having a front and a rear wall in spaced relationship; (b) polarizing means comprising two windows made of polarizing material and having axes oriented perpendicular to each and positioned adjacent to one another in the rear wall of said housing for dividing a light beam from the projector into separate parts having polarization axes oriented perpendicular to each other as it passes into said housing (c) separating means inside said housing for separating said divided and oriented light into its own separate beams, said separating means comprising a set of two reflectors mounted at approximately a 45° angle to the back wall of said housing with the

backmost edge of said reflectors forming approximately a 90° angle vertically adjacent to each other at the adjacent line of said back windows, said reflectors being located to receive the light rays projected into said housing through said back windows and reflect said light rays, (d) superimposing means inside said housing for superimposing said separated beams on a viewing screen, said superimposing means being located to receive the light reflected by said separating means and comprising two reflectors mounted inside said housing one of

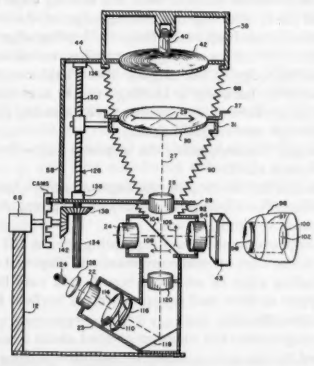


which is adjustably mounted and the other is fixadly mounted; (e) adjusting means for adjusting the adjustably mounted reflector manually from outside of said housing; (f) shielding means for eliminating an undesired excess image which appears on the side of the desired projected picture; comprising a pair of slideable wall segments that act to extend outwardly the inside edge of said front windows and being positioned in slots located in the front wall of said housing; (g) a pair of windows located in said front wall of said housing through which said separated light beams can pass out of said housing.

3,891,314
REFERENCE INSERTION DEVICE

Charles T. Lakin, Winter Park, and William J. Leighty, Orlanda, both of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Continuation-in-part of Ser. No. 63, Jan. 2, 1970, abandoned. This application Nov. 16, 1972, Ser. No. 307,308
Int. Cl. G03b *5/00, 21/14*
U.S. Cl. 353—101 **24 Claims**

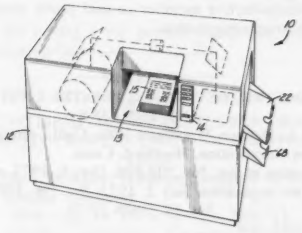


1. An optical device for providing a linearly expanding representation of a scene to simulate radical changes in range, comprising a mounting member, with respect to which an internal image of the scene can be formed, an enlarging lens mounted for extensive, nonlinear movements with respect to said member, a scene source mounted in optical relationship to said enlarging lens, and movable linearly with respect thereto, and means including a pair of cams, rotatable at different speeds about the same axis of rotation cooperating to provide motion between the scene source and said enlarging lens concurrently with providing motion between said enlarging lens and the internal image, such that because of preascertai optical relationships involving the characteristics of said enlarging lens, the location of the internal image will be essentially stationary with respect to said member, throughout a substantial size variation of the internal image.

3,891,315
ELECTROPHOTOGRAPHIC REPRODUCTION APPARATUS

James Andrew Kolibas, Broadview Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Dec. 3, 1973, Ser. No. 421,121
Int. Cl. G03g *15/00*
U.S. Cl. 355—8 **6 Claims**



1. An electrophotographic reproduction apparatus for producing sheet copies of original documents, said apparatus comprising:

a housing,

radiation sensitive means at a first location in said housing for receiving a focussed image of the original document to be copied,

radiation means for irradiating the original document at a second location in said housing spaced from said first location,

an access opening formed in said housing,

a loading station for receiving original documents to be copied in face-up orientation, said loading station being disposed in said access opening at a location generally intermediate said first and second locations,

transport means for controlled movement of each original document from said loading station to said second location in face-up orientation,

optical means for providing said focussed image to said radiation sensitive means including an optical path between said radiation sensitive means and said radiation means passing generally above said loading station and access opening, and

an original document output station adjacent said second location for receiving original documents in face-up orientation,

said transport means moving the original documents from said second location to said output station in face-up orientation subsequent to irradiation.

3,891,316
MULTI-PROCESS CONTROL SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

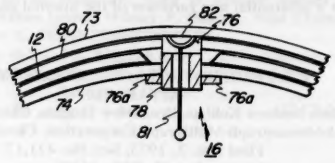
Charles A. Whited, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1974, Ser. No. 452,023
Int. Cl. G03g *15/00*
U.S. Cl. 355—14 **16 Claims**

1. An electrophotographic printing machine of the type having a plurality of processing stations, including:

a photoconductive member mounted movably in the printing machine and arranged to pass through each of the processing stations; and

probe means mounted on said photoconductive member and arranged to be located in a preselected position along the length thereof, said probe being adapted to simulate



said photoconductive member for generating an electrical signal indicative of the instantaneous condition of said photoconductive member as said probe passes through each processing station.

3,891,317

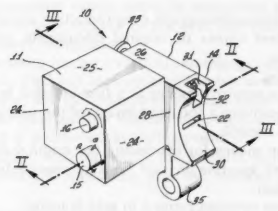
PHOTOMETRIC DEVICE FOR PRINTER LIGHT SOURCE AND THE LIKE

Richard A. Walker, Woodland Hills, Calif., assignor to Kollmorgen Corporation, Hartford, Conn.

Continuation of Ser. No. 204,820, Dec. 6, 1971, abandoned. This application July 2, 1973, Ser. No. 375,802

Int. Cl. G03b *27/76*

U.S. Cl. 355—68 **5 Claims**



1. In combination with an optical printer having a light source and having an exit port transmitting unmodified light from said source for exposure of print stock to be later located at and covering the plane of said port:

an electro-optical device for measuring characteristics of light transmitted through and at said plane of said uncovered exit port and in the absence of print stock comprising

a photometer means and an adaptor means for operatively associating said photometer means with said optical printer;

said adapter means including an entrance aperture alignable and in proximate relation with the plane of said exit port to receive and pass all of the light transmitted through the uncovered exit port;

said photometer means including

a biprism elememt at said entrance aperture to collect and reimage all of said light passing through said uncovered exit port;

a photovoltaic cell means including a plurality of separate electrically isolated cell elements in proximate relation to receive and respond to all of said light transmitted by said prism element in reimaging light at said exit port on said cell means;

each of said cell elements having an area responsive to light transmitted through corresponding incremental areas of said exit port and said entrance aperture;

and circuit means connected with each cell element and having switch means to independently select the response of each cell element and to summate response of all of said cell elements;

said cell elements being calibrated to respond equally to a selected light source whereby differences in response of each of said cell elements correspond to differences in characteristics of light passing through the incremental areas of said exit port and entrance aperture.

3,891,318

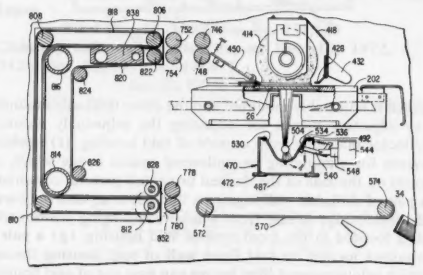
METHOD AND APPARATUS FOR REGISTERING, FEEDING AND SEPARATING ORIGINAL AND COPY SHEETS IN A DUPLICATOR

Albert F. Touchette, Shutesbury, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 7, 1974, Ser. No. 440,457

Int. Cl. G03b *27/30*

U.S. Cl. 355—100 **14 Claims**



12. A sheet separator for a microfiche duplicator including:

1. an exposure station having a source of actinic radiation;

2. a copyboard having leading and trailing edges relative to said exposure station and comprising a radiation-transmissive plate adapted to carry thereon superposed original microfiche and copy sheets, said original sheet being adjacent said radiation-transmissive plate and between said plate and said copy sheet, the upper surface of the leading edge of said copyboard being covered with a compressible material with the leading edge of the original sheet abutting the trailing edge of the compressible material and separated from the leading edge of the copy sheet by an overhanging member extending over the leading edge of the original sheet, said copyboard being movable between a loading station and said exposure station where said copy sheet is exposed to said radiation through said original sheet;

3. means for separating the exposed copy sheet from the original sheet;

4. means for developing the exposed copy sheet; and

5. means for feeding the separated, exposed copy sheet to said developing means;

the improvement in said separating means (3) comprising:

a linear cam on said copyboard and disposed ahead of the leading edge of said copyboard, said cam having a first upper surface and a second lower surface formed by a recess therein;

a spring-loaded flat member pivoted about a horizontal axis and having an arm riding on said first surface of said cam as said copyboard advances from the loading station to the exposure station, the height of said first surface causing the leading edge of said flat member nearest the leading edge of the copyboard to be disposed at a distance above the superposed original and copy sheets;

said recess being located in said cam such that when the superposed original and copy sheets initially are advanced past said exposure station, said arm rides into said recess causing the leading edge of said flat member to be pivoted against the leading edge of said copyboard against said compressible material and under the leading edge of the exposed copy sheet but over the overhanging

member, wherein as said copyboard advances further past said exposure station, said arm rides out of said recess and onto said first upper surface thereby positively separating the leading edge of the exposed copy sheet from the leading edge of the original sheet, with the further movement of said copyboard past said exposure station resulting in positive separation of the entire exposed copy sheet from the original sheet and the feeding of the separated, exposed copy sheet to the developing means.

3,891,319

RECEIVER FOR IMPULSE-SHAPED LIGHT SIGNALS

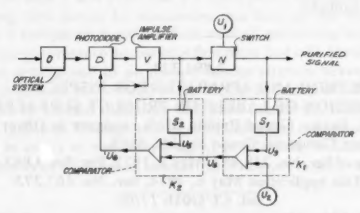
Hans Heinrich Meinke, Gauting; Gerhard Flachenecker; Friedrich Landstorfer, both of Munich; Heinz Lindenmeier, Planegg, and Karl Fastenmeier, Munich, all of Germany, assignors to Eltro GmbH Gesellschaft Fuer Strahlung Stechnik, Heidelberg, Germany

Filed Jan. 14, 1974, Ser. No. 433,383

Claims priority, application Germany, Jan. 16, 1973, 2301945

Int. Cl. G01c *3/08;* **H03f** *1/26*

U.S. Cl. 356—5 **15 Claims**



1. A receiver for impulse-shaped light signals in which the time interval between successive light signals considerably exceeds the duration of the individual light signals, means for effecting a first regulating sequence comprising zero-point suppressing means for reducing interference voltages occurring at the output of the receiver, sensitivity regulating means and amplifying regulating means for imparting a predetermined magnitude to remaining disturbance impulses, and means for effecting a second accelerated regulating sequence in addition to said first regulating sequence, said last-mentioned means having a regulating voltage dependent upon the output voltages of said receiver preceding said zero-point suppressing means.

3,891,320

LIGHT INTERFERENCE GAUGE AND FLATNESS TESTER

Yoshiaki Kimura; Masanori Kawai; Tatsuo Yajima, and Taneji Morishita, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1973, Ser. No. 417,204

Claims priority, application Japan, Mar. 31, 1973, 48-36176

Int. Cl. G01b *9/02*

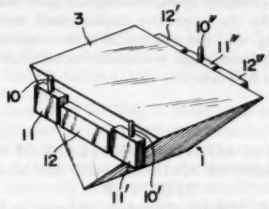
U.S. Cl. 356—109 **9 Claims**

1. A light interference gauge comprising:

a block having a reference surface with a high degree of flatness for receiving light beams projected obliquely thereto, said block having further surfaces intersecting said reference surface;

three supporting pieces secured to said intersecting surfaces; and

three pins individually anchored to said supporting pieces,



each pin having a top portion which juts beyond said reference surface.

3,891,321

OPTICAL METHOD AND APPARATUS FOR MEASURING THE RELATIVE DISPLACEMENT OF A DIFFRACTION GRID

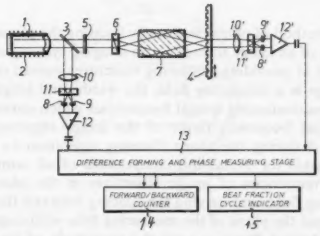
Fromund Hock, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Aug. 20, 1973, Ser. No. 389,713

Claims priority, application Germany, Aug. 21, 1972, 2240968

Int. Cl. G01b *9/02*

U.S. Cl. 356—111 **20 Claims**



1. In an optical method for measuring the relative displacement of a diffraction grating in its plane of division along at least one coordinate, with illumination of a grating by a light flux in a defined solid angle zone which is smaller than the corresponding angles of diffraction of the grating, and with evaluation of the partial light fluxes diffracted on the grating, the improvement comprising:

a. projecting an illuminating beam with two approximately equally intensive polarization components, which are polarized complementary to each other and each has a differing light frequency and, producing an electric reference signal which is phase-correlated to the difference signal of these components;

b. dividing the illuminating ray beam, by means of an optical component, into at least two mutually inclined partial beams, combining by means of a further optical component, at least two partial beams into at least one pair of parallel partial beams consisting of mutually complementary partial waves having different optical destinations wherein said diffraction grating is used as the dividing or combining component;

c. forming as a measuring signal by means of photoelectric transducers from each pair of parallel, recombined, complementarily polarized partial beams of different frequency, the difference frequency, modulated by a displacement of the grating in accordance with phase and frequency, between the complementary partial beams,

after the pair of partial beams has passed through a polarization analyzer; and

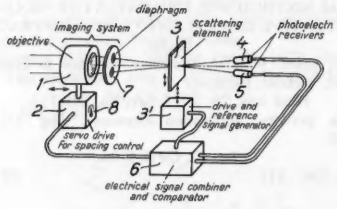
d. comparing the reference signal and the measuring signal with each other in an electric comparison device, wherein the relative phase of the two signals is determined as a measure for the respective displacement component of the grating, and the number of beats is stored with the correct arithmetic sign in accordance with the sign of the difference frequency.

3,891,322

METHOD OF LOCATING THE PLANE OF SHARP FOCUSSING OF AN IMAGE AND APPARATUS THEREFOR

Fromund Hock, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Germany

Filed Nov. 27, 1973, Ser. No. 419,430
Int. Cl. G01b 9/00
U.S. Cl. 356—126 **18 Claims**



1. A method of photoelectrically locating the plane of sharp focusing of an image formed by an imaging system comprising the steps of providing scattering structures moved relative to the image in a measuring field, the widths and lengths of the structures containing spatial frequencies which correspond to the spatial frequency range of the image structures to be optimized during the sharp focusing operation in order to make usable for evaluation components of all azimuths and spatial frequencies of image structures in the plane of the measuring field; and varying the spacing between the imaging system and the plane of the measuring field with respect to its magnitude and direction until the magnitude of the modulation transfer function in the evaluated image field segment becomes a maximum.

3,891,323

APPARATUS FOR DETECTING CHANGES IN THE ORIENTATION OF A MORTAR GUN TUBE

Maurice A. Ryan, Rock Island, Ill., and Morton A. Barron, Potomac, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 7, 1973, Ser. No. 395,119
Int. Cl.[2] G01B 11/27
U.S. Cl. 356—154 **8 Claims**

1. Apparatus for detecting and correcting orientation of a gun barrel mounted in the earth comprising:

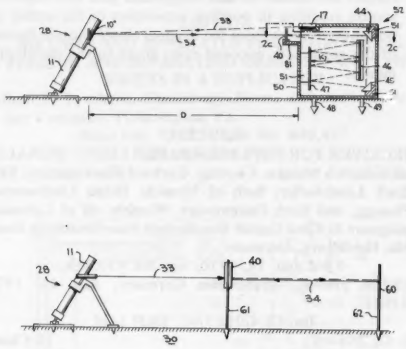
first means mounted in the earth for emitting a beam of light;

second means mounted in the earth comprised of a screen having a front and back surface having clear, translucent and opaque portions for

showing a first portion of the emitted beam by reflecting from the front surface of said screen the portion of the emitted beam impinging upon said opaque portion,

permitting a second portion of the emitted beam to pass through said clear portion after which said second portion undergoes at least one change of direction and is finally directed to the back surface of said screen,

showing the second portion of the emitted beam on said translucent portion of said screen



third means attached to said screen for avoiding reflection of sunlight

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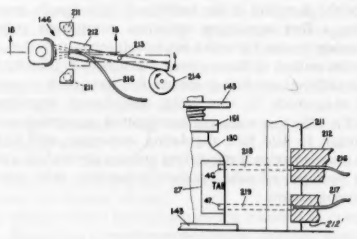
3,891,324

METHOD AND APPARATUS FOR INSPECTING POSITION OF LABELS ON PRODUCT SURFACES

John R. Davies, Grand Rapids, Mich., assignor to Oliver Machinery Company, Grand Rapids, Mich.

Division of Ser. No. 238,433, May 1, 1972, Pat. No. 3,843,440.
This application May 6, 1974, Ser. No. 467,373
Int. Cl. G01b 11/00
U.S. Cl. 356—156 **7 Claims**

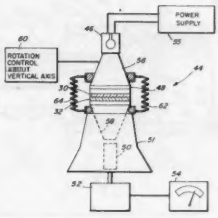


1. An improved inspection means for inspecting labels on product surfaces in order to verify the exact alignment of said labels after said labels are positioned on said surfaces by a label applying apparatus, said labels including verification dots and said inspection means including photo-scanning means and a control unit for inspecting and verifying the position of said labels on said product surfaces, said photo-scanning means being adapted to pivotally scan the face of each label in order to pick up and transmit light from said verification dots to said control unit, said control unit being adapted to automatically measure the distance from the beginning of each scan to said dots in order to indicate the horizontal and skew positions of said labels on said product surfaces, and to measure the intensity of light from said dots at a certain horizontal level in order to indicate said vertical positions.

3,891,325
MUCUS SAMPLING AND MEASURING SYSTEMS, DEVICES AND PROCESSES

Samuel R. Schuster, Wellesley, and Louis Kopito, Brookline, both of Mass., assignors to Ovutime, Inc., Wellesley, Mass.

Filed Sept. 20, 1973, Ser. No. 399,145
Int. Cl. G01n 21/24
U.S. Cl. 356—205 12 Claims

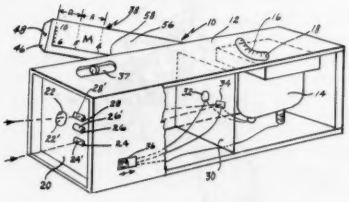


1. A system for determining the phase of a menstrual cycle for use with a first plate and a second plate, said system comprising first means for contacting one face of said first plate with a sample of bodily mucus, second means for uniformly applying a pressure across said first plate and said second plate when superposed to produce a mucus stratum between said faces, at least one of said plates being at least partially transparent to certain radiation, and third means for transmitting said radiation through one of said plates and said mucus stratum in order to produce a signal functionally related to absorptivity of said mucus stratum with respect to said radiation.

3,891,326
MULTI-CHANNEL SUN PHOTOMETER

Frederic E. Volz, 24 Tyler Rd., Lexington, Mass. 02173

Filed Jan. 14, 1974, Ser. No. 433,175
Int. Cl. G01j 1/42
U.S. Cl. 356—222 9 Claims



1. A multi-channel photometer comprising a housing, said housing having a front portion, a rear portion, a side portion and a top portion, said side and top portion forming an edge therebetween, said front portion having a plurality of openings therein, a different filter means optically aligned with each of said openings for filtering a beam of light passing through each of said openings, means optically aligned with each of said filter means for detecting the amount of light passing through each of said filter means, means operably connected to said detecting means for indicating the amount of light detected by said detecting means and means pivotally connected to said side portion of said housing for determining the angular relationship of said beam of light with respect to the horizontal, said angle determining means having a scale thereon whereby said angular relationship is determined by the intersection of said scale and said edge of said housing.

3,891,327
MOUNTED SLIDES AND METHOD OF SECURING A COVER GLASS TO A GLASS SLIDE HAVING A SPECIMEN THEREON

Mary Jeanne Welch, Timonium, Md., assignor to W. R. Grace & Co., New York, N.Y.

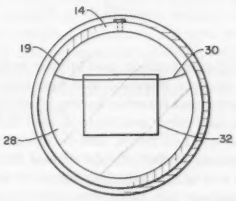
Continuation-in-part of Ser. No. 411,933, Nov. 1, 1973, abandoned. This application Nov. 23, 1973, Ser. No. 418,519
Int. Cl. G01n 21/16, 1/00; G02b 21/34
U.S. Cl. 356—244 4 Claims

1. The method of securing a cover glass to a glass slide having a specimen thereon which comprises covering the glass slide in the region of the specimen with a substantially uniformly thick layer of a liquid photosensitive composition consisting essentially of an optically transparent liquid photosensitive material having a viscosity in the range 50 to 2,000,000 centipoises at 25°C and 0.0005 to 50 percent by weight of the photosensitive material of a photoinitiator, positioning a cover glass over the specimen in contact with the photosensitive composition and thereafter exposing said photosensitive composition to UV radiation to form a solid, optically transparent bond holding the cover glass and the specimen in a fixed position on the glass slide.

3,891,328
ELECTRO-OPTICAL LIQUID ARTIFICIAL HORIZON

William P. Hall, 1783 Marison Dr., Ventura, Calif. 93003, and George R. Maupin, USNS, Box 22, FBPO, Norfolk, Va. 23593

Filed Oct. 3, 1973, Ser. No. 403,132
Int. Cl. G01c 9/18
U.S. Cl. 356—249 9 Claims



1. An instrument for generating an artificial horizon line comprising:
a vidicon tube having a face;
a volume of fluid; and
an enclosed, transparent, leak-proof fluid container positioned adjacent to said face of said vidicon tube such that light rays, incident upon said vidicon tube, pass first through said fluid container, said fluid container being partially filled with said fluid so that a horizontal fluid surface forms in said container at a fluid-air interface, said fluid surface interfering with a portion of an image being optically resolved by said vidicon tube creating an artificial horizon line capable of being visually observed on a television monitor.

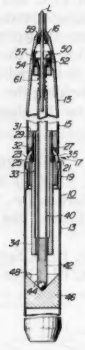
3,891,329
WRITING IMPLEMENT

Kazue Kato, Tomioka, Japan, assignor to Platinum Pen Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1974, Ser. No. 464,644
Claims priority, application Japan, Aug. 24, 1973, 48-99273
Int. Cl. B43k 21/16
U.S. Cl. 401—65 7 Claims

1. A writing implement comprising a casing, an elongated tubular member axially movable within said casing, and a chuck mechanism within said casing adjacent to the writing end of said implement, said chuck mechanism being adapted

normally to hold an elongated writing material against retraction from said writing end, said chuck mechanism including jaws connected to one end of said tubular member, wherein said casing is flexible when a force is exerted to said casing generally transversely of the axis thereof, means being provided for converting the flexion movement of said casing into a force to move said tubular member and said jaws toward said writing end whereby said writing material is projected a distance from said writing end, said casing comprising first and second sleeve members connected together by coupling means so that one of said sleeve members is angularly displaced with respect to the other, said converting means comprising a cam surface provided within one of said first and second sleeve members remote from said writing end, said tubular member having its other end disposed in sliding engagement with said cam surface, said tubular member carrying a ball of a hard material disposed in rolling contact with said cam surface, said tubular member having an end piece detachably mounted on said other end thereof, said ball being rotatably mounted on said end piece, said coupling means including an annular recess formed in one of said first and second sleeve members and a first coupling member secured to the other sleeve member and being movably received in said annular recess, said one sleeve member carrying a second tubular coupling member secured to said one sleeve member and having an outer peripheral surface in which an annular groove is formed, said elongated tubular member extending through said second coupling member, said annular groove forming a part of said annular recess, and said coupling member on the other sleeve member being tapered and extending into said annular recess.



3,891,330

SEALING GLAND FOR PRODUCT CONTAINER

Martin M. Vasas, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.

Filed Apr. 5, 1973, Ser. No. 348,103

Int. Cl. A46b *11/00*

U.S. Cl. 401—122 **9 Claims**

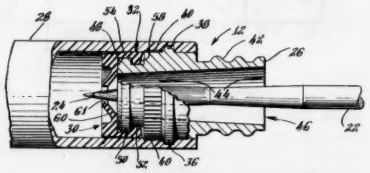
1. A sealing gland for providing a peripheral seal between a portal bushing and a reservoir body within a reservoir assembly and a portal seal about an applicator passing therethrough when the reservoir assembly is utilized as part of a product container, said fabricated gland being facricated of elastic material and comprising:

a tubular frame including a conical taper on the exterior thereof, said taper being effective to centrally locate said sealing gland within the reservoir assembly and to establish a symmetrically distributed interface therein;

an annular lip disposed on the interior wall of said tubular frame and to one longitudinal end thereof, said annular lip being engageable with an annular groove on the portal bushing to interlock said sealing gland thereto and being compressible within the reservoir assembly to develop a seal between the portal bushing and the reservoir body;

means for sealing about and wiping against the applicator, said sealing and wiping means being disposed on said tubular frame at the opposite longitudinal end from said annular lip, said tubular frame being of minimum diameter at the sealing and wiping means end and of maximum diameter at the annular lip end; and

a raised rim disposed about the external periphery of said tubular frame on the sealing and wiping means end thereof.



3,891,331

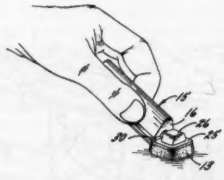
UNIT FOR DISPENSING LIQUID FROM A FRANGIBLE AMPOULE

Carl Frederick Avery, Rockford, Ill., assignor to Marion Health & Safety, Inc., Rockford, Ill.

Filed June 14, 1974, Ser. No. 479,354

Int. Cl. A45d *34/00*; **A61m** *35/00*

U.S. Cl. 401—132 **6 Claims**



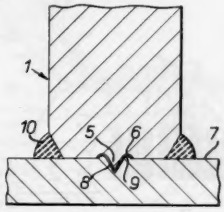
1. A unit for dispensing liquid, said unit comprising a one-piece body made of non-porous flexible material capable of retaining its shape, said body including an elongated blister having a top, sides, ends and an open bottom, a frangible ampoule filled with liquid and housed within said blister, a sheet of non-porous material bonded to said body and covering the bottom of the blister to retain the ampoule therein, said body having means located outwardly of one end of said blister and defining a chamber having an open bottom, a pad of porous material covering the bottom of said chamber, and a passage establishing communication between said blister and said chamber whereby, when the sides of said blister are squeezed inwardly to break said ampoule, the liquid therein may flow out of said blister and through said passage into said chamber from where the liquid may be dispensed through said pad.

3,891,332

WELDED ANCHORAGE STUD

George Molyneux, and George Walter Molyneux, both of Gloucester, England, assignors to Molyneux Engineering Company Limited, Gloucester, England

Filed Feb. 11, 1972, Ser. No. 225,577
Claims priority, application United Kingdom, Feb. 11, 1971, 4418/71; Sept. 3, 1971, 41160/71
Int. Cl. F16b 35/00
U.S. Cl. 403—13 1 Claim



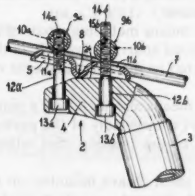
1. In a welded stud construction comprising a metal stud and a metal base member, the base member having in a flat surface thereof a punched depression around which is formed a crater lip, and the stud having an end face with a central projection for locating the stud by reception of said projection within said depression; the improvement in which said stud end face has an annular groove around said projection to accommodate the crater lip, an annuular flat land area around said groove which sits on said surface when the projection is engaged in said recesses, and a peripheral cutaway portion for accommodating a fillet weld.

3,891,333

MOUNTING ASSEMBLY FOR BICYCLE SADDLE OR THE LIKE

Maurice Louis Paul Jean Corderac'k, 64, rue Alsace Lorraine, Bron, Rhone, France

Filed Jan. 17, 1974, Ser. No. 434,246
Claims priority, application France, Feb. 5, 1973, 73/04557
Int. Cl. F16c 11/00; F16l 27/00
U.S. Cl. 403—84 10 Claims



1. A mounting assembly for securing a saddle having a pair of transversely spaced and longitudinally extending mounting rods to a support head with an upwardly directed support face, said assembly comprising:

a plate formed with a pair of longitudinally extending and transversely spaced seats receiving said rods and having a face turned toward said support face;

at least one securing member overlying said rods on said plate;

a transverse boss forming an elongated rounded cross section ridge on one of said faces and resting against the other face, said other face being generally flat; and

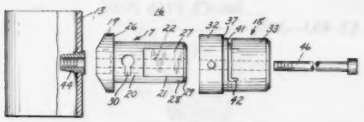
a pair of longitudinally spaced adjustment means flanking said boss and each including an adjustment element spanned between said member and said head for tilting said plate and said saddle relative to said head by shortening of one of said elements and lengthening of the other element.

3,891,334

CROSS BRACE INTERLOCK

Frank Loikitz, Middletown, N.J., assignor to Buildex Incorporated, Huntington, N.Y.

Filed Sept. 26, 1973, Ser. No. 401,017
Int. Cl. F16b 7/04
U.S. Cl. 403—234 10 Claims



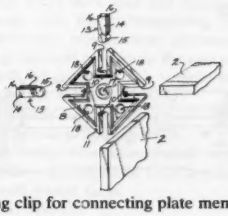
1. A structural assembly comprising a first structural member, a coupling member mounted on and projecting from said first structural member and including an axially extending expander section of non-circular transverse cross section and an expansion collar engaging said expander section and having a non-circular bore with a minor transverse dimension less than the major transverse dimension of said expander section and being expandable and contractable in response to angular variation between said expander section and expansion collar, and a second structural member having a bore axially slideably engaging said collar, said collar being rotatable relative to said expander member between a collar contracted condition with the major axis of said expander section and said collar bore coinciding permitting relative axial movement between said coupling member and said second structural member and a collar expanded condition locking said second structural member to said coupling member with the major axes of said collar bore and said expander section being relatively angularly offset.

3,891,335

RETAINING CLIP

Fred W. Feil, Racine, Wis., assignor to Continental Display Corporation, Racine, Wis.

Filed Oct. 25, 1973, Ser. No. 409,475
Int. Cl. F16b 5/06
U.S. Cl. 403—173 7 Claims



1. A retaining clip for connecting plate members, comprising:

a generally flat rigid body having a plurality of elongated slots formed therein, the slots extending from the edges of the body toward the center of the body, each slot having a rounded socket portion at the inner end of the slot, and the slots being of a width generally corresponding to the thickness of the plate members to receive the plate members in assembly.

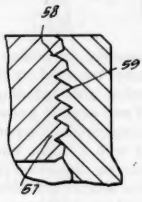
6. A retaining clip for connecting plate members, comprising a generally flat body having a generally square configuration provided with slots extending from each corner diagonally toward the center of the body, the slots being elongated

and having a width generally corresponding to the thickness of the plate members, said body having raised rim portions extending between slots along the four edges of the flat body and along the edges of the slots.

3,891,336
BALL JOINT AND METHOD OF MANUFACTURE THEREOF

Edward J. Herbenar, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 40,316, May 25, 1970. This application May 10, 1972, Ser. No. 252,023
Int. Cl. F16b *29/00*
U.S. Cl. 403—320 **2 Claims**

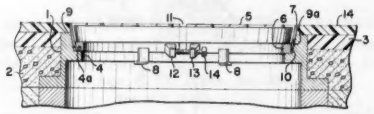


1. A joint structure comprising a housing having an open-ended cavity therein, a plug closing off said cavity, said plug having male threads around its periphery, said housing having female threads at each end swedged into engagement with said male threads, the ends of said plug having tapered male threads of lesser diameter than the threads mating with said lesser diameter threads thereby increasing the torque required to withdraw the plug from said housing thru said open end and to thread the plug tighter into the housing.

3,891,337
METHOD AND MEANS FOR ADJUSTING THE ELEVATION OF MANHOLE COVERS

Archibald Henry Richard McCoy, R.R. No. 1, Troy, Ontario, Canada

Filed Oct. 17, 1973, Ser. No. 407,354
Claims priority, application Canada, Oct. 16, 1972, 154481
Int. Cl. E02d *29/14*
U.S. Cl. 404—26 **5 Claims**

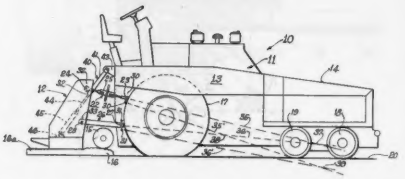


1. An elevating band for supporting a manhole cover in an elevated relationship to an inverted frusto conical recess defined in a manhole frame by an internal annular lip defining a manhole opening and a flange extending upwardly from the lip, the band being split at a single point on its periphery and comprising an expansible base ring seatable on said lip, an expansible inverted frusto conical rim welded to the out periphery of the base ring and engageable on expansion with said upwardly extending flange, abutments on the base ring adjacent the split in the periphery of the band, screw means acting between said abutments to expand the band, and lugs depending from said band and bendable beneath said lip.

3,891,338
CONVERGENT LINK SYSTEM FOR CONNECTING A SCREED TO THE TRACTION UNIT OF A PAVING MACHINE

Fred T. Smith, Dearborn Heights, Mich.; Julian M. Munyon, Big Rock, and James J. Gebhardt, Jr., Lisle, both of Ill., assignors to Barber-Greene Company, Aurora, Ill.

Filed Apr. 30, 1973, Ser. No. 355,931
Int. Cl. E01c *19/00*
U.S. Cl. 404—84 **7 Claims**



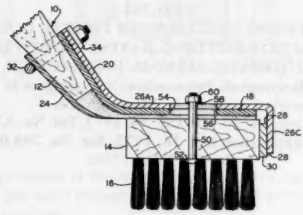
7. In a paving machine of the type including a self-propelled traction unit having traction means for supporting and propelling the paving machine over the existing surface, and a screed disposed rearwardly of the traction unit adjacent the rear end of the latter, the improvement comprising:

a. upper, longitudinally extending, link means connected at forward and rearward extremities to the rear and of the traction unit and to the screed for pivoting movement about respective, horizontally extending, transverse axes;
b. lower, longitudinally extending, link means connected to forward and rearward extremities to the rear end of the traction unit and to the screed for pivoting movement about respective, horizontally extending, transverse axes;
c. the imaginery extensions of said upper and lower link means converging to define an effective tow axis extending transversely of the traction unit adjacent said existing surface and forwardly of the rearwardmost extremity of the traction means;
d. said upper link means including a pair of links which are horizontally spaced apart transversely of the traction unit and are connected to the latter adjacent respective sides thereof;
e. said lower link means also including a pair of links which are spaced apart transversely of the paving machine and are connected to the traction unit adjacent respective sides thereof;
f. first adjustable pivot means mounted on the rear end of the traction unit adjacent one side thereof and connected to the forward ends of the adjacent upper and lower links for moving the respective pivot axes thereof up and down in unison;
g. second adjustable pivot means mounted on the rear end of the traction unit adjacent the other side thereof and connected to the forward ends of the adjacent upper and lower links for moving the respective pivot axes thereof up and down in unison;
h. automatic grade control means including a grade sensor and first power means activated thereby;
i. automatic slope control means including a slope sensor and second power means activated thereby;
j. means connecting said first adjustable pivot means with said first power means for being actuated thereby; and
k. other means connecting said second adjustable pivot means with said second power means for being actuated thereby.

3,891,339
PUSH BROOM HANDLE CLAMP

Carl H. Jeffers, 1021 W. Main St., Louisville, Ohio 44641

Filed Sept. 26, 1974, Ser. No. 509,332
Int. Cl. B25g 3/00
U.S. Cl. 403—192 3 Claims

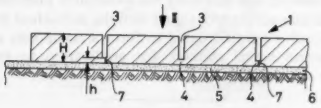


1. Apparatus to mount a handle to a push broom head which comprises
   a. a large flat plate having a conically tapered handle receiving flange projecting from one end thereof, said plate adapted to be securely received in snug fitting relation to a recessed groove on the top central surface of the broom head,
   b. a reinforcing bracket including means at one end thereof to connect it to the handle receiving flange and squeeze the handle therein, and means to connect it at the other end to the front face of the broom head, and
   c. means to secure the bracket and plate together and to the broom head.

3,891,340
PAVING STONE UNIT HAVING INTEGRAL CONNECTING WEBS

Hans Bolli, Weinberglistrasse 46, CH-60050 Lucerne, Switzerland

Filed Feb. 15, 1974, Ser. No. 443,093
Int. Cl. E01c 5/00
U.S. Cl. 404—38 6 Claims



1. A paving stone unit comprising a plurality of individual concrete paving stones spaced apart from each other in a predetermined pattern, said stones all being of substantially uniform thickness, and a plurality of webs joining said stones together, said webs also being of concrete and being integral with said stones and being of thickness not greater than one quarter of the thickness of said stones the distance by which each stone is spaced from adjacent stones being small relative to the lateral dimensions of said stones, whereby when individual stones in said unit are supported only by said webs and are subjected to normal traffic, the webs connecting such stones to the remainder of said unit will fracture while leaving all said stones intact.

3,891,341
WEAR BALANCED CLEAT FOR COMPACTION WHEEL

Maurice J. Trainor, Milwaukee, and Charles F. Riddle, Brookfield, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Aug. 13, 1973, Ser. No. 388,334
Int. Cl.[2] E01C 19/26
U.S. Cl. 404—121 6 Claims

1. In a wheel for a vehicle used to compact sanitary land fill, said wheel comprising:
   a. a rigid cylinder forming a rim;
   b. hub mounting means upon which the cylinder is secured; and
   c. ground engaging substantially V-shaped, symmetrical inverted cleats secured to the cylinder in circumferential rows, the cleats of adjacent rows being circumferentially offset and each cleat having
      i. an approximately square base,
      ii. opposite triangular ends generally normal to the wheel axis,
      iii. convergent wedge faces intermediate said ends, and
      iv. a working face opposite said base and intermediate said ends and said wedge faces,

the improvement wherein:
1. said working face has relatively wider end portions adjacent the radially outer corners of the cleat and a narrower intermediate portion, the length and width of the end portions in the axial and circumferential directions each being between one-fifth and one-tenth of the length and width of said base and the width of the intermediate portion being one-half or less the width of the end portions and
2. said wedge faces have end and intermediate portions which merge with the corresponding portions of said working face, the intermediate portions of said wedge faces being recessed relative to the end portions thereof.

4. In a cleat for a wheel of a vehicle used to compact sanitary land fill, said cleat having:
   a. an approximately square base,
   b. opposite generally triangular ends,
   c. convergent wedge faces intermediate said ends, and
   d. a working face opposite said base and intermediate said ends and said wedge faces,

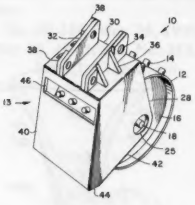
the improvement wherein
   i. said working face has relatively wider end portions adjacent said generally triangular ends and a narrower intermediate portion, the length and width of the end portions each being between one-fifth and one-tenth of the length and width of said base and the width of the intermediate portion being one-half or less the width of the end portions and
   ii. said wedge faces have end and intermediate portions which merge with the corresponding portions of said working face, the intermediate portions of said wedge faces being recessed relative to the end portions thereof.

3,891,342

BACKHOE COMPACTOR/SCRAPER APPARATUS

Harry James Roe, Richardson, Tex., assignor to Track Pack Corporation, Dallas, Tex.

Filed Feb. 15, 1974, Ser. No. 442,763
Int. Cl. E01c *19/00*
U.S. Cl. 404—128 **15 Claims**



1. A backhoe compactor for moving and compacting fill material in a construction excavation including a hydraulically-actuated boom assembly mounted on said backhoe, comprising

scraping means pivotally connected to said boom assembly for moving said fill material into said excavation,

a freely-rotatable compaction roller connected to said scraping means and having radially projecting roller teeth spaced around the roller circumference, and

comb means attached to said scraper means for cleaning said roller teeth as said compaction roller rotates,

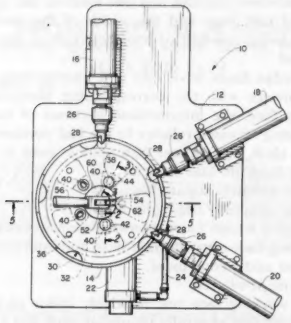
said scraping means including an attachment member partially encompassing said roller therein, one side of said attachment member forming a scraping member.

3,891,343

SPIDER MACHINING APPARATUS

Dalton M. Davis, Palo Verdes Estates, Calif., assignor to E-T Industries, Inc., Benicia, Calif.

Filed Mar. 11, 1971, Ser. No. 123,218
Int. Cl. B23b *39/20*
U.S. Cl. 408—42 **1 Claim**



1. A machining apparatus to form depressions within the circumference of a spider of a vehicle wheel assembly, the apparatus comprising:

a housing;

support means adapted to position the spider upon said housing, said support means being capable of incremental rotational movement relative to said housing;

forming means attached to said housing adapted to produce a plurality of separate spaced apart groups of depressions within the spider, said forming means includes a plurality of separate drilling units, the number of said drilling units and the number of said depressions within each of said groups being equal; and

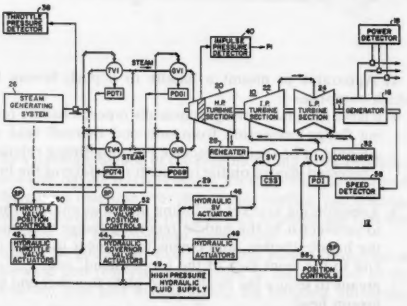
a pin assembly included within said support means adapted to cooperate with mounting holes located within the spider to retain the spider in position, said pin assembly includes a first pin and a second pin, said first pin having an eccentrically mounted head which is to cooperate with one of said mounting holes.

3,891,344

STEAM TURBINE SYSTEM WITH DIGITAL COMPUTER POSITION CONTROL HAVING IMPROVED AUTOMATIC-MANUAL INTERACTION

Andrew S. Braytenbah, Pennsauken, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 80,710, Oct. 14, 1972, Pat. No. 3,741,246. This application Oct. 16, 1972, Ser. No. 298,081
Int. Cl. F01d *17/00*
U.S. Cl. 415—1 **3 Claims**



1. A method for operating a steam turbine system for controlling power output to a generator connected to said turbine as a function of the position of the series of governor valves said method comprising: establishing individual governor valve setpoints for each respective valve during a sequential mode of operation; establishing a single valve setpoint applied in parallel to all of said governor valve controls during a single valve control; applying a single common manual control signal to all of said valves in parallel during a manual mode of operation, said single valve control signal and said manual control signal being switchably combined through an automatic-manual control; and summing the switchably combined automatic and manual control signal with the individual sequential governor valve control signal to form a composite governor valve control signal suitable for application to respective governor valve actuators.

3,891,345

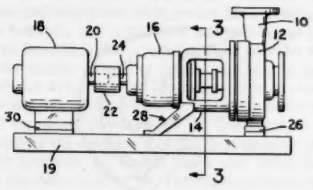
SUPPORTING FOOT MEANS FOR A SEPARATELY COUPLED CENTRIFUGAL PUMP

John H. Doolin, New Providence, N.J., assignor to Worthington Pump International, Inc., Mountainside, N.J.

Continuation-in-part of Ser. No. 418,431, Nov. 23, 1973, abandoned, which is a division of Ser. No. 257,583, May 30, 1972, Pat. No. 3,841,791. This application Mar. 8, 1974, Ser. No. 449,366
Int. Cl. F04b *35/04*
U.S. Cl. 415—121 R **3 Claims**

1. A support means in combination with a separately coupled centrifugal pump means including a bearing cartridge for a driven pump shaft, a pump casing with an impeller therein connected to and rotatable with the driven pump shaft, and an adaptor surrounding the driven pump shaft and spaced therefrom and operatively disposed to connect the bearing cartridge to the pump casing, said support means comprising:

a. a body member having means for connecting the body member to said separately coupled centrifugal pump medially therealong,
b. said body member including, a flat section forming leg means at the lower end,



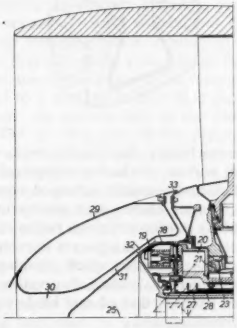
c. flange means at the upper end contoured to snugly engage the outer surface of the centrifugal pump in assembled position,
d. and said flange means disposed at an angle to the body member and the connecting means operatively associated with the flange means whereby the support means will be disposed at an angle to the longitudinal line of the centrifugal pump in assembled position.

3,891,346

FANS

John Gregory Keenan, Cheltenham; John Alfred Chilman, Stroud, and Ivor Harold Brooking, both of Gloucester, all of England, assignors to Dowty Rotol Limited, Gloucester, England

Filed Feb. 15, 1974, Ser. No. 443,144
Claims priority, application United Kingdom, Feb. 17, 1973, 7887/73
Int. Cl.[2] F01D *7/00*
U.S. Cl. 415—129 **13 Claims**



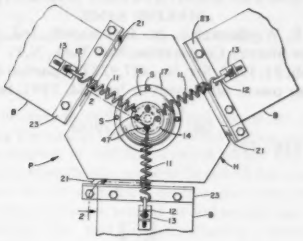
1. A fan assembly, for attachment to the front of a main gas turbine engine assembly to provide an engine of the ducted-fan by-pass type, constructed as a unitary assembly which can be fitted and removed as such and comprising a non-rotative sub-assembly, which includes a non-rotative main body and a non-rotative by-pass duct supported by the main body, and a rotative sub-assembly which is supported in bearings by the non-rotative sub-assembly and which includes a hub, carrying variable-pitch fan blading, positioned and rotatably supported within the by-pass duct, said hub including, disposed wholly therein so as to be rotatable all as one therewith, (a) a liquid reservoir, (b) at least one pump operable upon rotation of the rotative sub-assembly to draw liquid from said reservoir, (c) a liquid-pressure-operable actuator connected to said fan blading for effecting adjustment thereof, and (d) control valve means by way of which liquid discharged under pressure by said pump is directed to operate the actuator, and said main body being adapted to provide for said attachment of the fan assembly to the engine assembly.

3,891,347

CLUTCH-CONTROLLED, WIND-OPERATED, POWER PRODUCING PROPELLER

Marcellus L. Jacobs, and Paul R. Jacobs, both of Rt. 11, Box 722, Fort Myers, Fla. 33901

Filed June 10, 1974, Ser. No. 477,757
Int. Cl. F03d *7/04*
U.S. Cl. 416—32 **18 Claims**



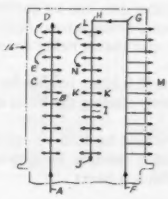
1. A clutch-controlled, wind-operated, multiblade propeller comprising a hub means rotatable upon a power output shaft, a plurality of propeller blades mounted on the hub means for rotation about the shaft, clutch means connected between the hub means and power output shaft to selectively transmit and interrupt rotation of the hub means to the shaft, clutch operating means connected with the clutch to cause engagement of the clutch when wind velocity and thus speed of rotation of the propeller reaches a predetermined value, and detent means connected with the clutch to prevent engagement of the clutch until said predetermined value is reached.

3,891,348

TURBINE BLADE WITH INCREASED FILM COOLING

Thomas A. Auxier, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 24, 1972, Ser. No. 246,778
Int. Cl. B63h *1/14*
U.S. Cl. 416—97 **7 Claims**



1. In a turbomachine, an air-cooled blade comprising:
a blade shell having an outer surface, first, second and third inner surfaces, and a leading edge and a trailing edge;
a first cavity in said shell proximate said trailing edge and formed by said first inner surface of said shell;
a second cavity in said shell remote from said trailing edge and formed by said second inner surface of said shell;
a third cavity in said shell proximate said leading edge and formed by said third inner surface of said shell;
means for introducing cooling air into said first cavity for cooling said first inner surface;

means for introducing cooling air into said third cavity for cooling said third inner surface;

a plurality of passageways formed through said trailing edge and communicating with said first cavity for efflux of a first portion of said first cavity cooling air therefrom;

means for directing the remainder of said first cavity cooling air from said first cavity into said second cavity for cooling said second inner surface; and

means for directing all of said cooling air delivered to said second cavity in a film from said second cavity onto said outer surface for cooling said outer surface.

3,891,349

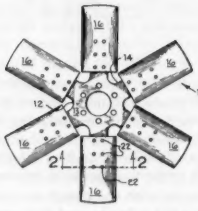
COOLING FAN CONSTRUCTION AND METHOD OF MAKING SAME

William E. Woollenweber, Jr., Indianapolis, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 227,922The portion of the term of this patent subsequent to June 24, 1991, has been disclaimed.

Int. Cl. F04d *29/38*

U.S. Cl. 416—132 **8 Claims**



1. A fan blade construction adapted for use in cooling systems for automotive and truck applications, said construction including,

a. an elongated spider arm,

b. a pair of sheet metal, elongated sheets of generally rectangular configuration, each sheet having a leading lengthwise edge and a trailing lengthwise edge,

c. said sheets being of a width greater than the width of said spider arm,

d. said sheets each being secured to said spider arm, to sandwich the spider arm, the longitudinal axis of the arm and the said sheets being substantially parallel,

e. at least one of said sheets being convex with respect to said spider arm,

f. at least one of said leading lengthwise edges of said pair of sheets resiliently abuting the other sheet of said pair of sheets,

g. whereby force would have to be exerted to displace the resiliently abutting leading lengthwise edge from the sheet against which it bears.

3,891,350

IMPELLER WHEEL FOR TORQUE CONVERTER OR FLUID COUPLING AND MANUFACTURING METHOD THEREOF

Kazuma Adachi, Yao; Masayoshi Tokunaga, Takatsuki, and Shigeru Takeshita, Neyagawa, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyegawa-shi, Japan

Filed Mar. 26, 1973, Ser. No. 344,539

Claims priority, application Japan, July 5, 1972, 47-67827

Int. Cl. F01d *5/04*

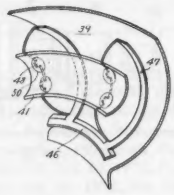
U.S. Cl. 416—180 **4 Claims**

1. Impeller wheel for torque converter or fluid coupling, comprising

a shell;

an integral array of ribbed blades attached to the inner surface of said shell;

a core ring attached to the radially inner ends of said blades, each said blade having an integral radial rib extending along the entire outer periphery of said blade,



an integral annular rib in the form of a ring-like band integral with one end of each of said radial ribs on said array of blades;

said array of blades being connected with the inner surface of said shell by means of said radial ribs along their entire length.

3,891,351

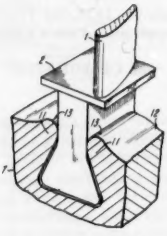
TURBINE DISC

Theodore J. Norbut, 3141 Claydor Dr., Dayton, Ohio 45431

Filed Mar. 25, 1974, Ser. No. 454,372

Int. Cl. F01d *5/30*

U.S. Cl. 416—219 **11 Claims**



1. A turbine machinery disc having bore, web and rim portions, the rim portion of which is comprised of:

a plurality of circumferentially arranged symmetrical slots for accommodating blades, each slot having blade tang-accommodating portions of given radius of curvature;

a set of symmetrical rim lugs adjacent to each slot, each lug having raised outer portions which are substantially of the same height and gradual radius of curvature, which radius of curvature exceeds that of said blade-tang accommodating slot portions; and

lower symmetrical rim portions of approximately equal diameter between said raised rim lugs;

said disc being further characterized as avoiding direct sharing of tension and compression between adjacent blades.

3,891,352

LIQUID-PISTON TYPE SLURRY PUMPING SYSTEM

Junya Tsukamoto, Hyogo, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1973, Ser. No. 409,809

Claims priority, application Japan, Nov. 2, 1972, 47-126937

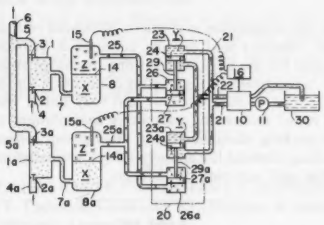
Int. Cl. F04f *11/00;* **F04b** *15/02*

U.S. Cl. 417—101 **4 Claims**

1. A liquid-piston type slurry pumping system operable in a slurry pipe line, said system comprising: a pump unit of a type continuously delivering a pressurized operating fluid which is

of a specific gravity different from that of slurry to be pumped and is substantially immiscible with, insoluble in, and unreactive with the slurry; at least two valve boxes each including a suction valve and a discharge valve connected respectively to the pipe line; at least a pair of liquid containers connected respectively to the valve boxes; passage means connecting said containers and said pump unit; means for changing over said passages between the pump unit and the liquid containers, thereby to introduce the operating fluid into the liquid containers alternately; detecting means provided in each of the containers for detecting any displacement in excess of a predetermined value of a boundary surface formed between the fluid and the slurry coexisting in the containers; a controller for controlling the operation of the fluid-passage changeover means in response to signals from said detecting means, whereby the pulsations of the boundary surfaces in the containers are controlled in response to the detected results of the detecting means, and the operation of the pumping system is thereby stabilized; and

a piston-cylinder device provided between the liquid containers and said fluid-passage changeover means, said device being comprised of means isolating the operating



fluid from the slurry but transmitting hydraulic displacement between the operating fluid and the slurry, first and third cylinders respectively including pistons connected together operatively, and second and fourth cylinders respectively including pistons connected together operatively, the first side of the piston in the first cylinder and the second side of the piston in the second cylinder being connected to a passage in said fluid passages changing over means, the second side of the piston in the first cylinder and the first side of the piston in the second cylinder being connected to another passage in said fluid passages changing over means, the first side of the piston in the third cylinder and the second side of the piston in the fourth cylinder being connected to one liquid container, the second side of the piston in the third cylinder and the first side of the piston in the fourth cylinder being connected to the other liquid container, said operating fluid occupying both sides of each of the first and second cylinders, and the interiors of the third and fourth cylinders being occupied by an additional operating fluid which forms a boundary surface in each of the liquid containers between itself and the slurry.

3,891,353

JET BOOSTERS

John Joseph Templeman, Solihull, England, assignor to British Gas Corporation, London, England

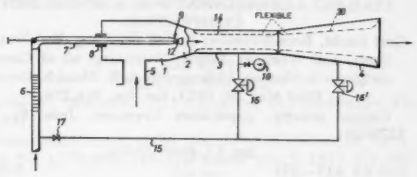
Filed Mar. 7, 1973, Ser. No. 338,928

Claims priority, application United Kingdom, Mar. 9, 1972, 10921/72

Int. Cl. F04f *5/48*

U.S. Cl. 417—183 **8 Claims**

1. A jet booster of the kind in which high pressure driving fluid is used to entrain low pressure fluid induced into said booster and compress it to an intermediate pressure, comprising an inlet opening for low pressure fluid, an axial driving nozzle within said inlet opening and open to a supply duct for high pressure driving fluid, said driving nozzle defining a nozzle throat and having a nozzle exit by which said driving fluid enters said booster, a plug which is longitudinally movable in said nozzle throat and which varies in cross-section along its length so as to change the effective area of said nozzle throat when said plug is moved longitudinally, a cylindrical portion forming the mixing throat of said booster which



is variable in cross-section, first control means for longitudinally moving the plug in said nozzle throat and second control means independent of said first control means and simultaneously but independently variable therewith for varying the cross-section of said cylindrical portion, said second control means including a conduit leading to said supply duct for high pressure driving fluid, said conduit including a pressure controller therein.

3,891,354

REGULATING SYSTEM FOR PUMPS

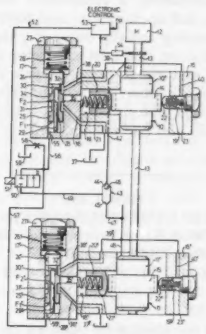
Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 11, 1974, Ser. No. 478,392

Claims priority, application Germany, June 22, 1973, 2331617

Int. Cl. F04b *49/00*

U.S. Cl. 417—216 **8 Claims**



1. In a pump system wherein at least two pumps are coupled to a single drive motor for pumping fluid under pressure through a discharge system, a regulating arrangement for preventing overloading and stalling of the drive motor, said regulating arrangement comprising at least two displacement control regulating means, one for each pump, and each having control slide means having a first and a second surface adapted to be subjected to the fluid pressure in the discharge system for moving the respective displacement control regulating means to thereby regulate the amount of fluid pumped by the respective pump; signalling means cooperating with

said drive motor for producing a signal in response to a predetermined high load on the motor; and means for subjecting said first surface to the fluid pressure in the discharge system in response to one of said signals so as to move the control slide means of at least one of said pumps to thereby reduce the amount of fluid delivered by said at least one pump.

3,891,355

COOLING ARRANGEMENT FOR A MOTOR DRIVEN COMPRESSOR

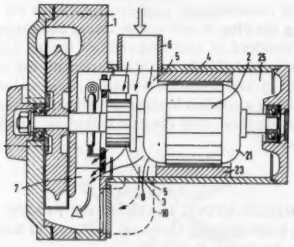
Gert Hecht, Brendlorenzen; Rudolf Schöning, Bad Neustadt, Saale, and Wolfgang Pieper, Wurzburg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 29, 1973, Ser. No. 364,276

Claims priority, application Germany, June 9, 1972, 2228326

Int. Cl. F04b *39/06*

U.S. Cl. 417—371 **5 Claims**



1. In a side channel compressor including a compressor housing having a compressor medium inlet disposed therein, and driven by an electric motor disposed in a motor casing mounted on said compressor housing, said motor including an armature disposed within said casing, and said compressor housing inlet opening into the interior space of said casing on one side of, and adjacent one end of, said motor armature, the improvement comprising a compressor medium inlet pipe stub, coupled to and opening into said interior space of said casing, and extending radially outwardly therefrom with respect to said armature, said inlet stub being disposed adjacent said one end of said armature on the side opposite said one side thereof, for directing the compressor medium transversely through said motor casing across said one end of said armature and into said compressor medium inlet, for cooling said motor.

3,891,356

FLUID GUIDE PLUNGER SYSTEM

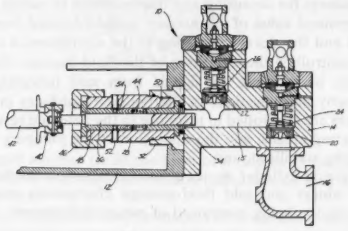
Frederick C. Christ, Long Beach, Calif., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Nov. 21, 1973, Ser. No. 417,941

Int. Cl. F04b *19/22*

U.S. Cl. 417—437 **7 Claims**

1. A pumping mechanism for pumping fluids having a fluid end containing an intake and an outlet provided with an intake valve and an outlet valve, respectively, at least one cylinder communicating with said fluid end, said cylinder having a packing element, a plunger axially mounted within said cylinder and movable therein in an extended position and in a retracted position, a power source including an associated power member, and coupling means joining said plunger and said power member, said pump pulling fluid through said intake valve into said fluid end and said cylinder when said plunger moves from its extended position to its retracted position and discharging fluid through said outlet valve when said plunger moves from its retracted position to its extended position; characterized by said coupling means being a floating connection comprising a hollow housing with openings at the forward and rearward ends thereof, said housing having an annular interior groove sized to just nicely receive the end of said power member, means securing the end of said power member in said housing, the opening of the forward end of said housing being defined by an annular rim, a disc secured to one end of said plunger by screw means, said disc being adapted to be received within said housing and maintained in abutment with the forward end of said power member, and spring means abutting the forward end of said disc and said



annular rim to maintain said disc in abutment with said power member, whereby said floating connection provides a solid connection for the high load pushing-discharge stroke of said plunger, a moderate spring loading connection for the pulling-suction stroke of said plunger, and only minor restraint for limited radial movement, permitting said plunger to seek its natural packing element center, thus giving longer plunger and packing element life and adjusting for misalignment possible within said pumping mechanism.

3,891,357

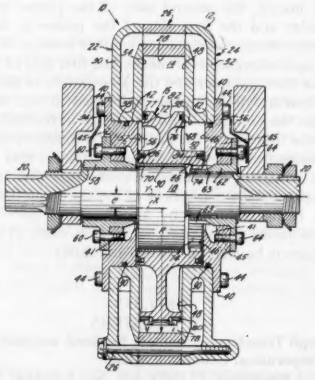
ROTARY MECHANISM OF THE TYPE HAVING A PLANETATING ROTOR

Robert C. Davis, Ramsey, and Winthrop B. Pratt, Haledon, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed May 3, 1974, Ser. No. 466,634

Int. Cl. F01c *1/02, 19/00;* **F04c** *27/00*

U.S. Cl. 418—61 A **9 Claims**



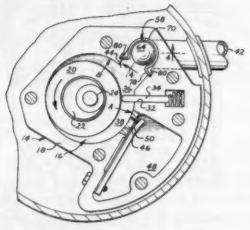
1. An improved rotary mechanism of the type having a housing comprising two end walls spaced in substantial parallelism by an intermediate peripheral wall to define therebetween a cavity and having a rotor supported for planetary movement within said cavity on an eccentric portion of a mainshaft supported for rotation in said two end walls, the improvement comprising

a. at least one of said end walls consisting of an outer portion and a separate central portion detachably secured to said outer portion;
b. said outer portion having a first inner sealing surface partly defining said cavity;
c. said central portion having a second inner sealing surface located radially inwardly of said first inner sealing surface and being so dimensioned and secured to said outer portion that the second inner sealing surface is in a plane substantially parallel to and axially outwardly offset from the plane of said first inner sealing surface to thereby define an axial recess communicating with said cavity;
d. the rotor having a face portion disposed in close spaced substantially parallel relation to said first sealing surface and having a tubular hub portion extending into said axial recess and with an end face in close spaced substantially parallel relation with said second inner sealing surface;
e. side gas seal means disposed to seal the interstices between said rotor face and said first seal surface as the rotor orbits within said cavity;
f. lubricant passageway means disposed radially inwardly of said end face of the tubular hub portion and said second inner surface for conducting oil to or from the eccentric portion of the mainshaft; and
g. side oil seal means disposed to seal the interstices between said end face of said tubular hub portion of the rotor and said second inner sealing surface as the rotor orbits within said cavity and thereby prevent the escape of oil from said lubricant passageway means.

3,891,358
SUCTION VALVE FOR ROTARY COMPRESSOR

William T. Ladusaw, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 373,188, June 25, 1973, abandoned. This application Apr. 29, 1974, Ser. No. 464,893
Int. Cl. F01c *1/02*
U.S. Cl. 418—63 **7 Claims**

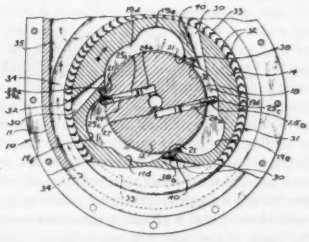


1. A rotary compressor comprising:
a cylindrical wall member and upper and lower end plate members defining an annular compression chamber for receiving a charge of refrigerant;
an inlet chamber in said cylindrical wall member extending between said upper and lower end plates and communicating with said compression chamber;
a suction port in said lower end plate including a valve seat communicating with said channel;
a valve member arranged for vertical movement in said inlet area between said valve seat and said upper plate when a refrigerant charge is introduced into said compression chamber during the operation of said compressor;
valve member holding means having a film of lubricant being formed in said upper plate in communication with the upper extremities of said inlet area for receiving a portion of said valve during operation of said compressor; and
said valve member holding means having a predetermined surface area relative to said portion of said valve member being dimensioned so that the surface tension of said lubricant between said valve and said holding means surface area is sufficient to retain said valve in said holding means during operation of said compressor and for releasing said valve to close against said valve seat when said compressor operation terminates.

3,891,359
ROTARY ENGINE

George W. Meacham, 2021 Edgewater Dr., Clearwater, Fla. 33515

Continuation-in-part of Ser. No. 237,815, March 24, 1972, Pat. No. 3,778,199. This application Apr. 9, 1973, Ser. No. 349,904
Int. Cl. F01c *19/00*
U.S. Cl. 418—104 **8 Claims**



1. A fluid-pressure operated rotary engine comprising: a relatively fixed hollow housing; a hub non-rotatably affixed to said housing, and having an outer cylindrical surface defining an annular chamber within said housing; an annular rotor mounted in said housing for relative rotation in said annular chamber, and having therein a plurality of peripherally spaced, camming cavities defining cam surfaces between intermediate bearing lands in rotational engagement with said cylindrical surface; said hub having therein peripherally spaced slots, of predetermined inward depth from said cylindrical surface, opening toward said chamber and being disposed in planes at angles to radial planes passing through the axis of said hub; slide plates slidably received in said slots, and having end portions presented to ride over said lands and said cam surfaces between the lands upon forward rotation of said rotor in said annular chamber; conduit means for providing a continuous supply of fluid-pressure medium through said relatively fixed hub to said slots for urging said slide plates radially outwardly toward engagement with said cam surfaces and said lands with rotation of said rotor; said slide plates having passage means for passage of predetermined proportions of fluid-pressure medium through said slide plates from said slots to the leading sides of the plates to create a pressure build-up within the corresponding said camming cavities, thereby to rotate said rotor in forward direction; and outlet passage means provided in said rotor for conducting the expended fluidpressure medium from said camming cavities at the trailing sides of said slide plates.

3,891,360
GEAR MACHINE WITH AXIALLY MOVABLE END WALL SEAL

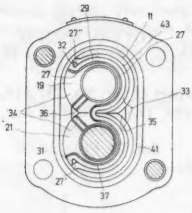
Wilhelm Dworak, Stuttgart; Claus Jons, Munich, and Jan Vlemmings, Hochdorf, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 4, 1974, Ser. No. 439,020

Claims priority, application Germany, Mar. 6, 1973, 7308439[U]

Int. Cl. F01c *19/08;* **F03c** *3/00;* **F04c** *15/00*

U.S. Cl. 418—132 **10 Claims**



1. In a fluid machine having a high pressure side and a low pressure side, a combination comprising a housing having a chamber which is bounded by a circumferential wall and two opposite end walls; a pair of meshing gears mounted in said chamber for rotation about axially parallel shafts, said gears each having two opposite axail ends; a plurality of shaft-journalling members, each associated with one of said shafts and each having one axial end face directed towards the associated gear for sealing engagement therewith and an other axial end face directed towards one of said end walls and away from the associated gear, at least some selected ones of said journalling members having limited freedom of axial movement relative to the associated gear; a recess formed in each of said other axial end faces of said selected journalling members and having substantially the contour of a numeral three the open side of which communicates with said low-pressure side; a pair of sealing elements accommodated in and corresponding to the contour of each of said recesses, each sealing element having free end portions having a nose-like projection and extending to said circumferential wall; and a small pressure space formed gradually adjacent and behind each of said free end portions intermediate the same and the associated recess and being in communication with said high-pressure side so that the pressure of fluid from said high-pressure side will constitute a force to urge said nose-like projections against said circumferential wall and thereby seal said chamber.

3,891,361
OIL SEAL MEANS OF A ROTARY PISTON ENGINE

Joji Miyake, and Takeshi Nakakobara, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

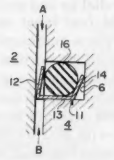
Filed Dec. 13, 1973, Ser. No. 424,327

Claims priority, application Japan, July 18, 1973, 48-80285; July 18, 1973, 48-80287; July 18, 1973, 48-80288; July 18, 1973, 48-80289

Int. Cl. F01c *19/00;* **F04c** *27/00;* **F16f** *1/34*

U.S. Cl. 418—142 **16 Claims**

1. An oil seal means of a rotary piston engine comprising an oil seal ring and an annular elastic sealing element operatively associated therewith, both being mounted in combination in an annular oil seal groove formed as cut at a side wall portion of a rotor, characterized in that said oil seal ring is composed of a first annular portion made of a relatively thin plate extending over a substantially conical surface, said first annular portion being urged against an oppositely arranged inner wall of a side housing of the engine to contact said inner wall at its radial inner annular edge portion, a second annular portion made of a relatively thin plate extending over a substantially cylindrical surface and connected at an annular edge thereof with said radial inner annular edge of said first annular portion, said second annular portion slidably fitting over a radially inner side wall of said annular oil seal groove, and a third substantially annular portion made relatively thin and extending over a substantially conical surface and connected at an



annular edge thereof with the other annular edge of said second annular portion, said third annular portion being separated into a plurality of sectoral elements arranged in series to provide as a whole a substantially annular element, said sectoral elements each acting as a spring means to urge said radially inner annular edge portion of said first annular portion against said inner wall of said side housing.

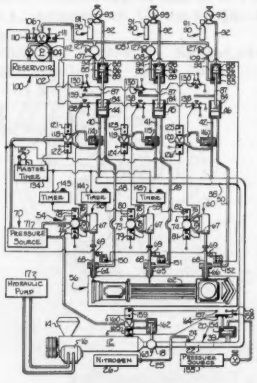
3,891,362
APPARATUS FOR MOLDING FOAMED THERMOPLASTIC ARTICLES

William R. DeVita, Matthews, N.C., assignor to Structural Foam Products, Inc., Pineville, N.C.

Continuation-in-part of Ser. No. 152,612, June 14, 1971, Pat. No. 3,746,492. This application May 30, 1973, Ser. No. 365,079

Int. Cl. B29d *27/04*

U.S. Cl. 425—4 R **16 Claims**



1. An apparatus for molding foamed thermoplastic articles comprising

accumulation means including a plurality of expansible and contractible chambers for receiving a predetermined amount of a mixture of thermoplastic material and blowing agent therein,

means for heating thermoplastic material and for mixing the thermoplastic material and a blowing agent and for conveying the resulting mixture under a first pressure sufficient to preclude the premature foaming thereof into each of said expansible and contractible chambers in said accumulation means,

mold means connected to each of said chambers in said accumulation means for receiving the mixture of thermo-

plastic material and blowing agent from said accumulation means under conditions of reduced pressure to permit the foaming of the mixture received therein,

means connected to said accumulation means for applying an expansion resisting pressure to each of said chambers during the receipt of the mixture therein to maintain the mixture under said first pressure in said chamber, and for applying a contracting pressure considerably higher than said expansion resisting pressure to said chamber to rapidly discharge the mixture from each of said chambers into said mold means, and

means for selectively establishing and terminating communication between each of said chambers and said mold means and comprising an independent discharge line extending from each accumulation chamber and terminating in an injection port, means for establishing communication through each of said discharge lines in a variably timed predetermined sequence upon all of said accumulation chambers having received their predetermined amount of the mixture, and means for independently teminating communication through each of said discharge lines upon the associated accumulation chamber being exhausted of its predetermined amount of the mixture.

3,891,363

MOLD SEGMENT FOR VULCANIZING MOLDS

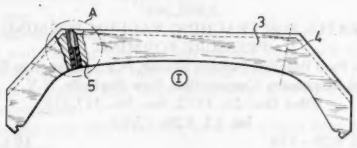
Willi Sievers, Korbach, and Andre Van Steenput, Arolsen, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Aug. 22, 1974, Ser. No. 499,531

Claims priority, application Germany, Aug. 23, 1973, 2342614

Int. Cl. B29r *1/00*

U.S. Cl. 425—28 R **7 Claims**



1. A mold segment for a vulcanizing mold comprising a plurality of radially movable segments, which comprises venting bores extending from the inside of said segment through said segment to the outside thereof, and tubular insert means of a fluor carbon inserted into said venting bores and extending from the inside of said segment along at least a portion of the length of said venting bores.

3,891,364

APPARATUS FOR THE CONTINUOUS VULCANISATION OF ENDLESS BELTS

Alexander Muller, Hoxter, Germany, assignor to Hoxtersche Gummifadenfabrik Emil Arntz K.G., Hoxten, Germany

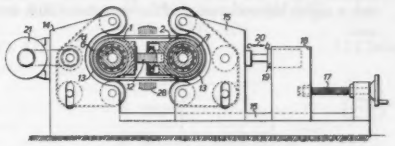
Filed July 22, 1974, Ser. No. 490,496

Claims priority, application Germany, July 25, 1973, 2337749

Int. Cl. B29h *5/28, 7/22*

U.S. Cl. 425—28 B **7 Claims**

1. Apparatus for the continuous vulcanisation of an endless belt, the apparatus having a vulcanising zone, and two heatable, parallel, equidirectional and synchronously drivable vulcanising drums therein, the drums each having a helical groove therein, the grooves in the two drums being of the



same sense and pitch, and arranged to move the belt continuously through the vulcanising zone.

3,891,365

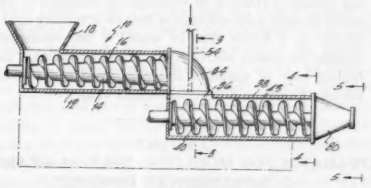
APPARATUS FOR MAKING A STRIATED SOAP BAR

Charles F. Fischer, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 30, 1973, Ser. No. 384,085

Int. Cl. B29f *3/12*

U.S. Cl. 425—131.1 **3 Claims**



1. An apparatus for producing striated soap bars on a double barrel soap plodder comprising a first barrel and a second barrel arranged in superposed position, first auger means in said first barrel, means for feeding soap into said first barrel at one end of said first barrel, a compression plate assembly for forming soap pellets at the other end of said first barrel a vacuum chamber at said other end of said first barrel communicating with said second barrel, second auger means including a pair of counter rotating screws in said second barrel, a pair of dye injection tips for injecting dye into said vacuum chamber and nozzle means at the other end of said second barrel for discharging striated soap bars, one of said screws rotating in a clockwise direction, the other of said screws rotating in a counter clockwise direction, each of said dye tips being disposed outwardly of the centerline of one of said screws and on the climb side thereof, said injection tip associated with said clockwise rotating screw being located at a position corresponding to a clock position of about 10:00 to 10:30 o'clock, said injection tip associated with said counter clockwise rotating screw being located at a position corresponding to a clock position of about 1:30 to 2:00 o'clock.

3,891,366

PELLETING OF CARBON BLACK

Wilson H. Rushford, London, England, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 13, 1974, Ser. No. 450,576

Int. Cl. B01j *2/12;* **C09c** *1/58*

U.S. Cl. 425—140 **3 Claims**

1. Apparatus for pelleting carbon black comprising:

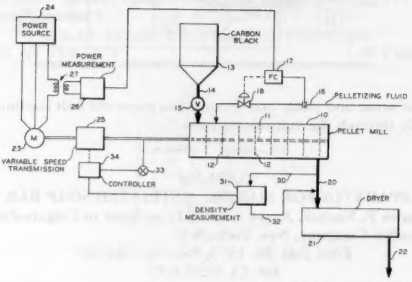
a generally horizontal pellet mill having a carbon black inlet, a pellet outlet, and axial rotary pin agitator mixing means positioned with said pellet mill;

conduit means communicating with said pellet mill to introduce a pelletizing liquid;

a motor;

a variable speed drive means connected said motor to said mixing means;

means to measure the bulk density of a volume of pellets removed from the outlet of said pellet mill and to establish a signal representative of the measured bulk density; and



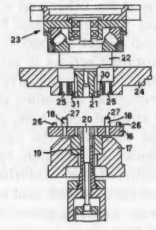
means responsive to said signal to control said variable speed drive means to adjust the speed at which said mixing means is rotated in response to changes in the measured density said responsive means actuating said mixing means at a lower rate of speed if the measured bulk density increases above a predetermined value and at a higher rate of speed if the measured bulk density decreases below said predetermined value.

3,891,367

APPARATUS FOR MOULDING HELICAL GEARS BY COMPRESSION OF POWDERS

Maurizio Signora, Palazzo Canavese, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Filed May 8, 1973, Ser. No. 358,426
Int. Cl. B22f *3/02, 5/08*
U.S. Cl. 425—78 **5 Claims**



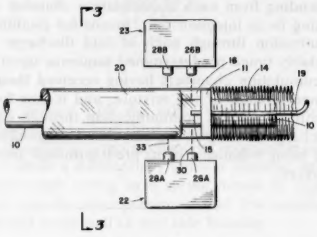
1. Apparatus for moulding helical gears by compression of a powder, comprising a die member having a toothed internal profile corresponding to that of the gear to be moulded, a movable punch having an externally toothed portion adapted to enter the die member to compress the powder, a guide member adapted to cause said portion to move with a helical motion with the same pitch as the said profile, said guide member comprising a female threaded member directly in engagement with the portion of the punch, and being movable towards the die member, and means for angularly positioning the guide member in an angular position fixed with respect to said die member, wherein said means for effecting angular positioning comprises at least one pin adapted to be introduced into a corresponding hole during movement of said guide member towards said die member, one of said members being provided with said pin and the other of said members being provided with said hole, stop means for the guide means being carried by one of said members and being such that when the guide is arrested by the stop means, the means for effecting angular positioning align the toothing of the punch portion with the toothing of the die.

3,891,368

SYSTEM FOR CONTROLLING THE DEPOSITION OF A COATING MATERIAL ONTO A PIPE OR THE LIKE

Milburn L. Hart, P.O. Box 15822, Tulsa, Okla. 74115

Filed Mar. 22, 1974, Ser. No. 453,706
Int. Cl. B29c *3/06*
U.S. Cl. 425—114 **9 Claims**



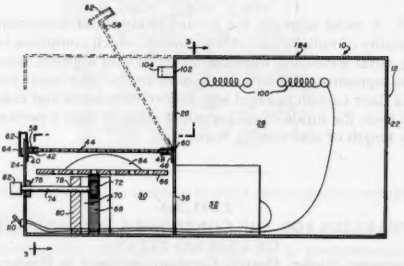
1. In an apparatus wherein a foamable material is deposited into an annular cavity formed around an elongated object and wherein the material is deposited into said cavity from a deposition assembly which is moved longitudinally relative to said object, the combination with said deposition assembly of two material presence detectors spaced apart longitudinally along said object to increase the relative deposition rate if the material is not detected at the detector furthermost from the deposition assembly and to decrease the relative deposition rate if the material is detected at the closestmost detector to the deposition assembly.

3,891,369

APPARATUS FOR TEACHING VACUUM FORMING AND PRESSURE FORMING

Francis Paul Pracilio, Pelham Manor, N.Y., assignor to Educational Machinery Corporation, New Rochelle, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,135
Int. Cl. B29c *17/04*
U.S. Cl. 425—174 **10 Claims**



1. A unitary apparatus for giving instruction in vacuum forming and pressure forming and adapted for selectively actuating either, comprising:

a. a housing defining a pump chamber and a pressure chamber;

b. a platen in said pressure chamber for supporting a mold thereon;

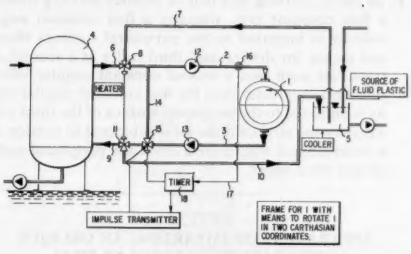
c. means for supporting a thermoplastic sheet in overlying relation with said pressure chamber;

d. means for holding the thermoplastic sheet in said overlying relation with said pressure chamber;
e. means for heating said sheet when in said overlying relation for softening said sheet:
f. a pressure pump in said pump chamber;
g. a vacuum pump in said pump chamber;
h. passage means for connecting both said pumps to said pressure chamber; and
i. means for selectively energizing said pressure pump and said vacuum pump, whereby to selectively pressure form and vacuum form said thermoplastic sheet.

3,891,370
APPARATUS FOR MAKING HOLLOW BODIES FROM THERMOPLASTIC MATERIALS BY ROTATION-MELTING

Herbert Giehler, Dautphe-Wilhelmshutte, Germany, assignor to Elkamet-Werk Lohn-Kunststoff, Biedenkopf/Lahn, Germany

Filed May 28, 1974, Ser. No. 474,006
Int. Cl. B29c *5/04*
U.S. Cl. 425—144 **7 Claims**

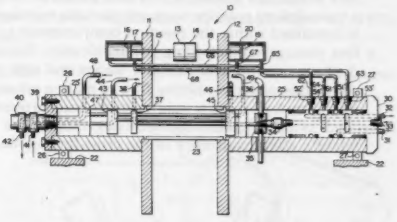


1. An apparatus for producing hollow thermo-plastic bodies by rotation-melting, comprising:
a frame;
at least one mold;
said mold having double walls spaced from each other to define at least one heat exchange chamber;
means to rotate said mold about two axes in Carthasian coordinates;
a cooling tank and a heating tank for a fluid heat transfer medium;
a forward flow cycle pipe line for the heating fluid and a return flow cycle pipe line for the cooling fluid; and
means to connect said cycle lines through said chamber alternatingly with said heating and cooling reservoirs;
including a three-way forward valve and forward flow pump in the forward flow cycle pipe line and a three-way return valve and a return flow conveyor in the return flow cycle pipe line;
said pump and said conveyor, each being interposed between said mold and its respective three-way valve;
a mixing line connected to said return flow line between the mold and the return flow valve and ending in the forward flow line between the centrifugal pump and its three-way valve, to connect the forward flow and the return flow lines;
a mixing valve interposed in said mixing line;
a timer programmer;
a thermometer probe interposed between the mold and the mouth of the mixing line in the forward flow line;
an electric circuitry connecting the thermometer probe with said programmer;
an impulse transmitter connected to actuate said mixing valve;
said timer-programmer connected to actuate said impulse transmitter.

3,891,371
FLUID DISTRIBUTOR FOR ROTARY BLOW MOLDING

Nicholas N. Sokolow, Roscoe, Ill., assignor to Plasti-Mac, Inc., Longwood, Fla.

Filed Apr. 30, 1973, Ser. No. 355,657
Int. Cl. B29c *5/00*
U.S. Cl. 425—233 **32 Claims**



1. A blow molding apparatus comprising: a base, a pair of opposed spaced apart plates rotatably mounted on the base for rotation about an axis in synchronism with each other, at least one pair of opposed mold dies having recesses which form a blow mold cavity when the dies are closed against each other, said mold dies being operatively connected to the plates for rotation therewith and mounted between the plates for movement towards and away from each other, to close and open the mold cavity, respectively, power means for closing said mold dies, said power means being operatively connected to the plates to rotate therewith, and a distributor means for distributing oil to and from the said power means, said distributor means comprising:
a hollow sleeve coaxial with said axis and operatively connected to the plates for rotation therewith, said sleeve including apertures therethrough,
a stationary fluid distributing shaft within the sleeve,
first passage means for delivering pressurized fluid into the distributor shaft,
second passage means for removing low pressure fluid from the distributor shaft,
axially spaced grooves in said shaft selectively mating with said apertures in the sleeve for communicating said power means with said first and second passage means,
the tolerance between the surface of the distributor shaft and the interior of the sleeve being too large to serve as a fluid seal between the respective grooves, and including O ring seals on the distributor shaft separating the grooves from fluid communication with each other,
and bearing means for forming the sole wear surface between the distributor shaft and the hollow sleeve, said bearing means comprising a pair of bearing rings removably mounted on one of said distributor shaft or hollow sleeve so as to form the sole wear surface of that member with the other of said distributor shaft or hollow sleeve.

3,891,372
APPARATUS FOR THE HIGH-PRESSURE CROSS-LINKING MOLDING OF POLYMERS

Mamoru Takiura, Kawasaki, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 206,030, Dec. 8, 1971, abandoned. This application Mar. 15, 1973, Ser. No. 341,783
Claims priority, application Japan, Dec. 18, 1970, 45-113124; June 14, 1971, 46-42456
Int. Cl. B29f *1/06*
U.S. Cl. 425—244 **8 Claims**

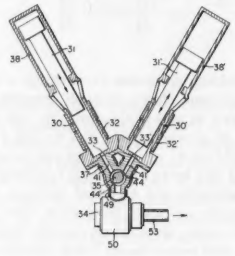
7. A high-pressure fluid cross-linking molding apparatus for molding polymers, comprising:
first extruder means for melting and kneading a mixture composed of a polymer and a cross-linking agent by

applying such temperature and pressure as will not give rise to a cross-linking reaction;

a reaction unit having a reaction chamber adapted to receive therein the mixture from the extruder means and a relatively movable reaction plunger associated therewith, said reaction unit having means associated therewith for applying a temperature and a pressure on said mixture which is higher than the internal temperature and pressure developed within the extruder means so as to cause a cross-linking reaction to occur when the molten mixture is contained within the reaction compartment;

a first passageway providing communication between the discharge end of said extruder means and said reaction compartment for permitting flow of molten mixture from said extruder means to said reaction compartment;

second extruder means for receiving therein the molten mixture after occurrence of the cross-linking reaction;



a second passageway providing communication between said reaction compartment and said second extruder means for permitting the mixture, after the cross-linking reaction has occurred, to be transferred from said reaction compartment to said second extruder means;

a molding head assembly for permitting discharge therefrom of the cross-linked polymer, and a third passageway providing communication between said molding head assembly and the discharge end of said second extruder means; and

transfer valve means associated with said first and second passageways for alternately opening and closing said first and second passageways to provide for the intermittent and alternating flow between (1) said first extruder means and said reaction compartment and (2) said reaction compartment and said second extruder means.

3,891,373

MOLDING APPARATUS AND CHOPPER FOR FORMING RUBBER SLUGS

Gordon L. Newby, 320 Industrial St., Bakersfield, Calif. 93307

Division of Ser. No. 224,115, Feb. 7, 1972, Pat. No. 3,758,249. This application July 23, 1973, Ser. No. 381,530

Int. Cl.[2] **B29H** *3/06;* **B29C** *15/00*

U.S. Cl. 425—301 **8 Claims**

1. An improved chopper for forming slugs from a continuous length of a resilient, flexible stock material comprising:

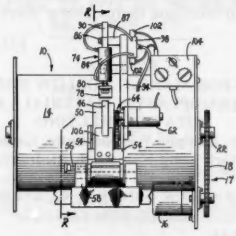
A. a pair of adjacently disposed, counter-rotating rollers having defined therebetween a bite through which is fed a continuous band of stock material adhered to the peripheral surface of one roller of said pair;

B. means including a pair of cutting disks pressed against the periphery of said one roller for severing a substantially uniform, continuous strip of material from said band;

C. a third rotating roller disposed adjacent to said one roller for receiving and transporting said strip about a portion of the peripheral surface thereof;

D. severing means including a knife disposed adjacent to said third roller, and means supporting said knife for rectilinear reciprocatory motion along a path extended in substantially radial directions with respect to said third roller;

E. means for imparting rectilinear reciprocatory motion to said knife at a substantially constant cyclic rate, whereby said continuous strip is severed at substantially uniform intervals as the strip is conveyed about the surface of said third roller; and



F. means for driving said pair of counter-rotating rollers at a first constant rate, whereby a first constant angular velocity is imparted to the peripheral surfaces thereof, and means for driving said third roller at a second constant rate such that a second constant angular velocity substantially greater than the first constant angular velocity is imparted to the peripheral surface of the third roller, whereby the strip of material is subjected to tension as it is received and transported about the peripheral surface of said third roller.

3,891,374

APPARATUS FOR IMPARTING AN OBLIQUE ORIENTATION TO TUBULAR FILM

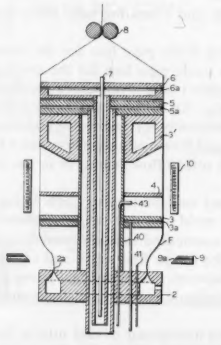
Tomokazu Ninomiya, Iwakuni, and Nobuhiro Hirata, Otake, both of Japan, assignors to Mitsui Petrochemical Industry Ltd., Tokyo, Japan

Filed Mar. 27, 1973, Ser. No. 345,369

Claims priority, application Japan, Mar. 31, 1972, 47-32228

Int. Cl. B29d *23/04*

U.S. Cl. 425—326 R **2 Claims**



1. An apparatus for producing a tubular film which comprises: an extruder and an annular die for extruding a tubular film of a thermoplastic resin; means located adjacent said die for cooling said film; a fixed mandrel mounted above said die coaxially therewith and including a slit on its peripheral surface for sucking said film to secure it firmly to said fixed mandrel; a rotating mandrel mounted above said fixed mandrel coaxially therewith and including a slit on its peripheral

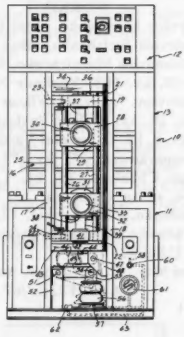
surface for sucking said film to secure it firmly to said rotating mandrel, said rotating mandrel being capable of imparting torsion to said film between it and said fixed mandrel thereby to orient said film obliquely; a heating zone located between said fixed mandrel and said rotating mandrel; heating means located exteriorly between said fixed and rotating mandrels for heating the tubular film in said heating zone to its orientation temperature; and a pair of nip rollers mounted above said rotating mandrel for pulling out the oriented film, said nip rollers being capable of rotating synchronously and concentrically with said rotating mandrel.

3,891,375

TABLET PRESS

John J. Pilewski; Lawrence F. Plotz, and Richard A. Pruisman, all of Cedar Rapids, Iowa, assignors to Vector Corporation, Hiawatha, Iowa

Filed Jan. 21, 1974, Ser. No. 435,302
Int. Cl.[2] B29C *3/00*
U.S. Cl. 425—344 **9 Claims**



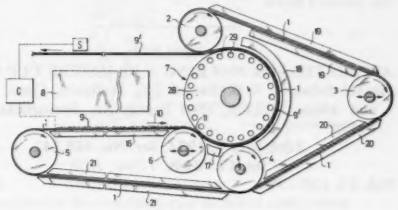
1. A high speed press comprising a frame structure, a rotor rotatably supported by said frame structure on a vertical axis and carrying a plurality of dies and coacting first and second plurality of punches receivable in said dies, driving means connected to drive said rotor, cam means for moving said punches relative to said dies, material feed means furnishing material to be formed to said dies, and a movable door support means pivotally attached on said frame structure by a vertical shaft and a pair of vertically adjustable pressure rolls rotatably supported on a pair of support columns and engageable respectively with said first and second plurality of punches and both of said pressure rolls cantileverly supported on horizontal axes by said movable door support means wherein said door support means is movable about said vertical shaft to a first position where said pair of pressure rolls respectively engage said first and second plurality of punches and movable about said pair of support columns to a second position where said pair of pressure rolls do not engage said first and second plurality of punches.

3,891,376

APPARATUS FOR THE CONTINUOUS PRODUCTION OF CHIPBOARD OR LIKE MATERIAL

Rolf Gersbeck, Hannover; Berndt Greten, and Hans-Peter Steininger, both of Springe, all of Germany, assignors to Bison-werke Bahre and Greten GmbH and Co. KG, Springer/Deister and Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, both of Germany

Filed Oct. 9, 1973, Ser. No. 404,387
Claims priority, application Germany, Oct. 6, 1972, 2249146
Int. Cl. B29j *5/04*
U.S. Cl. 425—373 **32 Claims**



1. Apparatus for the continuous production of boards such as chipboards, fibreboards and the like; said apparatus comprising:

an endless band,

pressing means,

guiding and moving means for guiding and moving said band with a surface of said band in facing relationship to a pressing surface of said pressing means over a material pressing portion of the travel path of said band such that material forming said boards can be conveyed by and compressed between said band and said pressing surface along said material pressing portion,

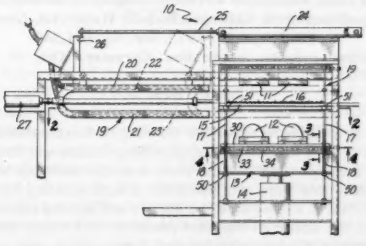
a plurality of heat transfer elements disposed adjacent portions of the travel path of said band, said heat transfer elements being spaced from one another in a direction transverse to the travel path of said band, and temperature control means for maintaining said elements at different temperatures with respect to one another for accommodating transfer of different heat levels between the respective elements and respective width portions of the band.

3,891,377

APPARATUS FOR FABRIC MOLDING

Jack E. Howard, Los Angeles, Calif., assignor to International Fabric Molders, Inc., Los Angeles, Calif.

Filed June 22, 1973, Ser. No. 372,652
Int. Cl. B29c *3/00, 17/02*
U.S. Cl. 425—383 **3 Claims**



1. In an apparatus for molding flat thermoplastic fabric material into three dimensional contours which includes a

hydraulic press having complementary male and female molds disposed in alignment with each other and means for moving said molds into engagement with each other with said fabric disposed between said molds, the improvement which comprises means for heating said molds, independent means for simultaneously radially heating said fabric immediately prior to molding, and means for controlling said heating and molding, both said molds and fabric being heated to a lesser degree of heat than if either the molds or the fabric were heated alone to such a degree for an adequate shaping as in conventional hot and cold molding, whereby said fabric, when molded with said lesser degree of heat, in both the molds and fabric, has better laundering qualities than conventional cold molded fabric and a softer feel and less distortion than conventional hot molded fabric.

3,891,378

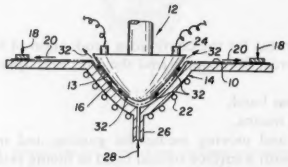
APPARATUS FOR MOLDING A BRASSIERE CUP SHAPE

Harold Belmuth, 8 Highwood Ln., Westport, Conn. 06880, and Alfred R. Leto, 1541 Parker St., Springfield, Mass. 01129

Filed May 9, 1974, Ser. No. 468,242

Int. Cl.[2] B29C *17/00, 1/00*

U.S. Cl. 425—398 **1 Claim**



1. An apparatus for molding a brassiere cup shape in a plastic fabric comprising a first body having a shaping surface bounding a conical volume serving as one molding member, a vertically reciprocating second body having a conically shaped surface serving as another molding member and arranged for descending movement into said conical volume in close proximate relation to said shaping surface of said first body so as to define a shaping compartment of conical configuration between said molding members, and pressure air means operatively connected to inject pressure air into said shaping compartment at the apex of said conical configuration thereof at the conclusion of the molding operation of said molding members, whereby said injected pressure air radiates from said point of entry circumferentially throughout said conical shaping compartment to stabilize the shaped fabric therein preparatory to the parting of said molding members.

3,891,379

SPINNING HEAD WITH AN EXCHANGEABLE, SELF-SEALING NOZZLE ASSEMBLY

Erich Lenk, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

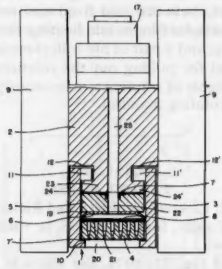
Filed Sept. 27, 1973, Ser. No. 401,540

Claims priority, application Germany, Oct. 5, 1972, 2248756

Int. Cl. B29f *3/04*

U.S. Cl. 425—464 **10 Claims**

1. A spinning head for the spinning of thermoplastic polymers around a vertical axis, including a relatively stationary feed member supplying the melt, a nozzle assembly laterally withdrawable from and insertable in said spinning head and connectable to said feed member in self-sealing relationship under the action of the melt pressure, said nozzle assembly comprising a casing member and, supported by and retained in said casing member, spinning elements including at least a die plate, elongated cooperating guideways being respectively provided on said feed member and said casing member for the withdrawal and insertion of said casing member with said spinning elements therein, said guideways being disposed so



that the self-sealing forces due to the action of the melt pressure give rise, in a direction parallel to the vertical axis of said spinning head, substantially to only tensional stresses in said casing member.

3,891,380

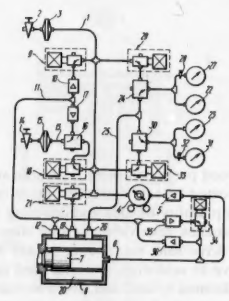
FUEL-FEED SYSTEM OF COMBUSTION CHAMBER IN AN IMPULSE-EFFECT MACHINE FOR PLASTIC METAL WORKING

Vadim Grigorievich Kononenko, ulitsa Chkalova, 15, kv. 12; Vitaly Evgenievich Strizhenko, ulitsa Osnovyanskaya, 56; Stanislav Anisimovich Maznichenko, Saltovsky Massiv, 521 mikroraion, 68, kv. 188; Vladimir Nikolaevich Sarancha, ulitsa Kosmonavtov, 7a, kv. 71; Viktor Alexeevich Stelmakh, ulitsa Kirova, 18, kv. 2; Igor Pavlovich Komnatny, ulitsa Chelyuskintsev, 6, kv. 1; Serafim Vasilievich Schekochikhin, Pervaya Lesoparkovaya, 5, kv. 76; Viktor Vasilievich Bozhko, ulitsa Chkalova, 15, kv. 1; Nikolai Borisovich Ponomarenko, ulitsa Chkalova, 15, kv. 1; Valeria Mikhailovna Danilenko, ulitsa Lenina, 12, kv. 150, and Sergei Vasilievich Yatsenko, Moskovsky prospekt, 204/1, kv. 36, all of Kharkov, U.S.S.R.

Filed Mar. 12, 1974, Ser. No. 450,495

Int. Cl. F23c *3/02*

U.S. Cl. 431—1 **2 Claims**



1. A fuel-feed system of the combustion chamber in an impulse-effect machine for plastic metal working, comprising in combination the following components: a high pressure air line (1); a shut-off device (7) of said combustion chamber; a pressure governor (4); a non-return valve (5) positioned in the direction of the air stream flow; a pneumoelectric valve (9); a non-return valve (10); an admission valve (12) provided on a shell (8) of said combustion chamber; said high pressure air line (1) communicating through said pressure

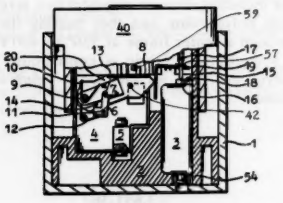
governor (4) and said non-return valve (5) with the air side of said shut-off device (7) and being series-connected (with respect to the direction of the air stream flow) to said admission valve (12) through said pneumoelectric valve (9) and said non-return valve (10); a low pressure gas line (13); an air-operated valve (16); a non-return valve (17); said low pressure gas line (13) being communicated in series (with respect to the direction of the combustible gas flow) with said admission valve (12) through said air-operated valve (16) and said non-return valve (17); a compression release valve (19) provided on the shell (8) of said combustion chamber to communicate the interior space (20) thereof with the atmosphere; a pneumoelectric valve (21) to communicate said compression release valve (19) with said high pressure air line (1); a pressure relief valve (26), provided on the shell (8) of said combustion chamber; a pneumoelectric valve (29); an air-operated valve (24) controlled by compressed air from said high pressure air line (1) through said pneumoelectric valve (29); a meter (22) to measure combustible gas pressure inside the interior space (20) of said combustion chamber, said meter being connected, through said pressure relief valve (26) and said air-operated valve (24) to said interior space (20) of said combustion chamber; a pneumoelectric valve (33); an air-operated valve (30) controlled by compressed air from said high pressure air line (1) through said pneumoelectric valve (33); a meter (23) to measure combustible mixture pressure inside said interior space (20) of said combustion chamber, said meter being connected through said pressure relief valve (26) and said air-operated valve (30) to said interior space (20) of said combustion chamber; a pipeline (6) communicating, through said admission valve (12), said interior space (20) of said combustion chamber with said air side of said shut-off device.

3,891,381

SPARK IGNITABLE CIGARETTE LIGHTER

Nobuyoshi Moriya, Urawa, Japan, assignor to Mansei Kogyo Kabushiki Kaishya, Kawaguchi-shi, Japan

Filed Mar. 28, 1974, Ser. No. 455,866
Claims priority, application Japan, Mar. 31, 1973, 48-39329
Int. Cl. F23q *2/28*
U.S. Cl. 431—255 **18 Claims**



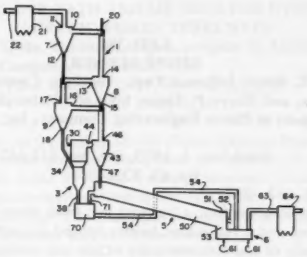
1. A piezoelectrically energizable spark ignitable cigarette lighter comprising a casing, piezoelectric means for generating a high voltage, a striker operatively engageable with said piezoelectric means, an actuator member for effecting displacement of said striker, a pair of spaced electrodes defining a spark gap connectable to said piezoelectric voltage generating means, a fuel tank disposed within said casing, a burner assembly including a burner nozzle connected in fuel transfer relation with said fuel tank and a burner housing member disposed around said burner, said burner housing having a top wall with a flame opening therein and a peripheral wall having at least one aperture therein, and an air deflecting wall disposed in radial alignment with said aperture to shield said burner nozzle from direct flow of combustion supporting air passing through said aperture.

3,891,382

APPARATUS FOR CALCINING RAW MATERIAL

Thomas R. Lawall, Emmaus, and Edward S. Porter, Bethlehem, both of Pa., assignors to Fuller Company, Catasauqua, Pa.

Filed Feb. 27, 1974, Ser. No. 446,435
Int. Cl. F27b *15/00, 15/10*
U.S. Cl. 432—58 **6 Claims**



1. Apparatus for calcining raw material comprising:

a vessel having an inlet for raw material to be calcined, means for producing a combustion zone in said vessel, as inlet for combustion air and an outlet for spent combustion air and calcined material whereby the direction of combustion air flow is from said inlet for combustion air to said outlet for spent combustion air through said vessel;

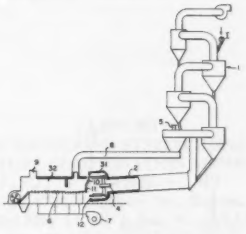
said inlet for raw material and combustion air being located upstream of said inlet for fuel and said outlet for spent combustion air in the direction of combustion air flow.

3,891,383

ROTARY KILN APPARATUS WITH SUSPENSION PREHEATER HAVING BURNER FOR CALCINING

Toshihiro Kobayashi, Tokyo, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1973, Ser. No. 421,329
Claims priority, application Japan, Dec. 6, 1972, 47-12164
Int. Cl. F27b *7/02, 7/38*
U.S. Cl. 432—80 **3 Claims**



1. Apparatus of the type having a suspension preheater to which powdery raw materials are supplied and also having a calcining burner, a rotary kiln for receiving the raw materials and including a burner for burning the raw materials to cement clinker and also including a discharge end for the clinker, and a planetary type multicylinder precooler associated with said discharge end comprising a plurality of cylinders arranged in a circle concentric with the kiln, said cylinders extending parallel to the kiln longitudinal axis and having means at its outlet ends to provide direct communication with the atmosphere and having its inlet ends communicating with said discharge end, the outlet ends of each cylinder being

provided with an upstanding weir means arranged to allow discharge of clinker only when the cylinders approach the highest position of rotation and a main cooler having an inlet for receiving clinker from the outlet ends of the cylinders and a vent port connected with the calcining burner.

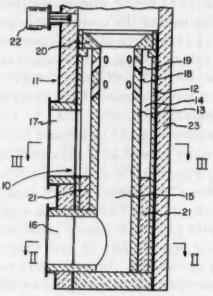
3,891,384

STOVE BURNER

James E. Hovis, Jefferson Twp., Allegheny County; James E. Johns, and Harry P. Finke, both of Pittsburgh, all of Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Nov. 5, 1973, Ser. No. 412,667
Int. Cl. F23l 9/04
U.S. Cl. 432—217 6 Claims

1. In combination, a vertical hot blast stove combustion chamber and a refractory burner spaced inwardly and independently of and concentrically within said combustion chamber, said refractory burner comprising an annular exterior wall in axial alignment with and positioned at substantially the bottom of the combustion chamber, a concentric inner vertical wall forming an annular chamber between said walls and a central mixing chamber, a gas inlet extending into the mixing chamber near a bottom end thereof, a combustion air inlet extending into the annular chamber, a baffle formed in the inner wall spaced upwardly of the air inlet and having at least one row of combustion air apertures extending through the



vertical inner wall and into the mixing chamber, said apertures being skewed relative to the mixing chamber so as to be inclined both upwardly and obliquely thereinto to form a swirling flow pattern in a convergent manner.

CHEMICAL

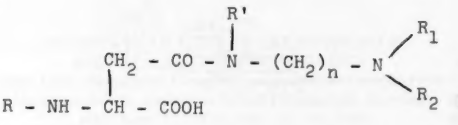
3,891,385

HAIR SOFTENING DYE COMPOSITIONS CONTAINING SURFACE-ACTIVE ASPARAGINE DERIVATIVES

Gregoire Kalopissis; Andre Viout, both of Paris, and Guy Vanlerberghe, Montjay-la-Tour, all of France, assignors to Societe Anonyne dite: L'Oreal, Paris, France

Division of Ser. No. 12,477, Feb. 12, 1970, which is a continuation-in-part of Ser. No. 424,846, Jan. 11, 1965, Pat. No. 3,534,032. This application Sept. 6, 1972, Ser. No. 286,698
Int. Cl. A61k 7/12
U.S. Cl. 8—10.1 3 Claims

1. A hair and dye softening composition comprising an effective amount of an asparagine compound having the formula:



or its sodium potassium, or ammonium salt, wherein R and R' are selected from the group consisting of alkyl having 10 to 18 carbon atoms and alkenyl having 10 to 18 carbon atoms;

R_1 and R_2 are lower alkyl or together with the nitrogen atom on which they are attached constitute morpholino;

and n is an integer of 2 to 5,

which has an acid pH, and a hair coloring amount of a hair dye.

3,891,386

PROCESS FOR CONTINUOUSLY TREATING SPUNLACED NONWOVEN POLYESTER TEXTILES ON A TENTER FRAME

James P. Reid, Jr., and Bobby L. McConnell, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed June 13, 1973, Ser. No. 369,592
Int. Cl. D06p 5/00
U.S. Cl. 8—18 7 Claims

1. A process for dyeing a spunlaced nonwoven polyester fabric which comprises padding said fabric with an aqueous pad liquor including disperse polyester dye, leveling agent and ammonium polyacrylate and then passing the thus padded fabric through a tenter frame at 350° to 400°F for 20 to 90 seconds whereby said fabric is continuously and simultaneously dyed and heat set said fabric being overfed to the tenter frame.

3,891,387

METHOD FOR CHECKING THE YARN PATTERN IN A FABRIC

Bruce M. Latta, Bloomingdale, and John J. Willard, Jr., Fair Lawn, both of N.J., assignors to J. P. Stevens and Co., Inc., New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 301,928
Int. Cl. D06p 5/00
U.S. Cl. 8—18 6 Claims

1. A process for checking a pattern of a greige fabric containing yarns having different dyeing properties and different oleophilic properties, after a plurality of adjacent yarns have broken during production of said fabric on a knitting machine or loom and said broken yarns have been rethreaded using fugitive tints on the yarns for identification, said process comprising applying an emulsion of an oil and either an alkanol or water to an area of fabric containing said rethreaded yarns without removing said area from the fabric being produced by

said knitting machine or loom, allowing said fabric to at least partially dry whereby the emulsion breaks and different amounts of oil migrate to the yarns having different oleophilic properties, applying a solution of a fugitive tint to said fabric and drying said fabric whereby a color pattern is developed by the overtinting in which the color is dependent on the amount of oil on each yarn.

3,891,388

EXHAUST PROCESS FOR THE DYEING OF SYNTHETIC FIBRE MATERIALS

Rütger Neeff, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation of Ser. No. 161,282, July 9, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 416,867

Claims priority, application Germany, July 10, 1970, 2034264; May 18, 1971, 2124495; May 18, 1971, 2124496

Int. Cl. C09b *5/62*

U.S. Cl. 8—39 **12 Claims**

1. Process for dyeing synthetic fiber material by exhaustion comprising introducing synthetic fiber material into a dyebath which is a dispersion consisting essentially of

A. organic solvent

B. anthraquinone dyestuff containing 1 to 3 sulfonamide groups and largely insoluble in said dyebath; and

C. up to 1% by weight of said organic solvent of water; said organic solvent consisting of water immiscible aliphatic halogented hydrocarbon;

dyeing at a temperature of 60° to 170°C for 10–60 minutes until the dyebath is exhausted;

said anthraquinone dyestuff free of reactive groups, acid groups and carboxamide groups having the formula

$$[A](X—Y—D)_n$$

in which

A is an unsubstituted anthraquinone radical or an anthraquinone radical substituted with halogen, hydroxy, C_1–C_4-alkoxy, nitro, amino, C_1–C_4-alkylamino, cycloalkylamino, arylsulfonylamino or C_1–C_4-alkylsulfonylamino groups;

D is a sulfonamide group;

X is a single C—C-bond, —NH—, —O—, —S—, $-SO_2-$ or $—SO_3—$;

Y is a single C—C-bond, arylene, C_1–C_4-alkylene, C_1–C_4-alkylene-arylene, C_1–C_4-alkylene-oxyarylene or alkylene-thioarylene; and

n is 1 or 2.

3,891,389

SHRINKAGE-CONTROL TREATMENT FOR KNITTED FABRICS

Gerald B. Verburg, Metairie; John G. Frick, Jr., and John D. Reid, both of New Orleans, all of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 31, 1973, Ser. No. 328,199

Int. Cl. D06c *1/02*

U.S. Cl. 8—149.2 **7 Claims**

1. In the process of producing finished, durable-pressed, knitted, cotton-containing garments wherein cotton-containing knit fabric is crosslinked to impart durable-press characteristics to the fabric and then formed into garments, the improvement comprising agitating the fabric in a slack condition after said fabric is crosslinked but before it is formed into a garment.

3,891,390

BASIC DYE-BATH AND METHOD FOR DYEING ACRYLIC FIBERS THEREWITH

Sadaharu Abeta, Toyonaka, Japan, assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 14, 1971, Ser. No. 134,056

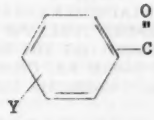
Int. Cl. D06p *3/76*

U.S. Cl. 8—173 **5 Claims**

1. A process for dyeing acrylic fibers obtained from a long-chain synthetic polymer composed of at least 70 percent acrylonitrile units by weight which comprises treating said fibers with a dyebath consisting essentially of:

a. a basic dyestuff containing a pentavalent nitrogen atom;

b. an aromatic ketone of the formula



wherein Y is selected from the group consisting of hydrogen, halogen and alkyl of 1–4 carbon atoms and R is alkyl of 1–4 carbon atoms; and

c. a dye-dissolving agent selected from the group consisting of acetic acid, formic acid, thio-diethylene glycol, diethylene glycol, and ethylene glycol; wherein said (b) constitutes the major portion of said dye-bath and said (c) constitutes a minor portion of the total dye-bath composition;

and thereafter subjecting the treated fiber to heat treatment.

3,891,391

FLUID FLOW MEASURING SYSTEM USING IMPROVED TEMPERATURE COMPENSATION APPARATUS AND METHOD

George R. Boone, 4730 Ridgebury Dr., Dayton, Ohio 45440

Filed May 14, 1973, Ser. No. 360,134

Int. Cl. G01f *1/00;* **G01p** *5/10*

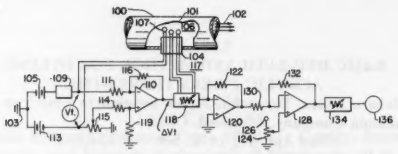
U.S. Cl. 73—204 **29 Claims**

1. A method for processing the electrical signal generated by a self-heated flow responsive thermal element in a fluid flow measuring apparatus to obtain therefrom a flow indicative output signal that is substantially invarient with respect to fluid temperature, said method comprising the steps of:

exciting a fluid immersed thermal element with a signal generating constant current that is independent of fluid temperature and flow rate and selected to operate the element at a temperature above the fluid temperature;

subtracting from said thermal element signal a constant offset signal that is greater than zero and smaller than the

smallest magnitude of said thermal element signal during any condition to be measured and wherein said offset signal has the same value for all flow rates and temperatures of the fluid being measured and selected in accordance with the properties of the measuring apparatus and the flowing fluid, thereby forming a corrected signal;



selecting a predetermined different fractional part of said corrected signal for use as said flow indicative output signal at each fluid temperature;

whereby removing said constant offset signal prior to selecting a fractional part of the corrected thermal element signal for use as an output signal allows said output signal to be selected from said corrected signal independently of flow rate.

3,891,392

METHOD OF MAINTAINING A COLUMN OF LIQUID WITHIN AN OPEN-ENDED TUBE, AND A TUBE DEVICE FOR CARRYING OUT THE METHOD

Peter Alan Betts, 40 Oldfield Rd., Chesire, Sandbach, and Kenneth Stephenson, 18 Hodder Ave., Littleborough, both of England

Filed Jan. 24, 1973, Ser. No. 326,233

***Claims priority, application United Kingdom, July 4, 1972, 31127/72**

Int. Cl. B01l *3/02*; **G01f** *13/00*; **G01n** *1/10*

U.S. Cl. 23—230 R **1 Claim**

1. A method of maintaining a column of liquid within an open-ended tube comprising the steps: placing within the tube a plug of porous material having a capillary attraction for a liquid, positioning the plug at a predetermined distance from one end of the tube corresponding to the height of the desired column of liquid, placing the one end of the tube in communication with a supply of liquid, applying to the other end of the tube suction sufficient to draw a column of liquid from the liquid supply into the tube to a position wherein its surface level lies above the plug, terminating the suction to lower the column of liquid until the liquid surface contacts the plug, and maintaining the remaining column of liquid by capillary attraction between the liquid and the plug.

3,891,393

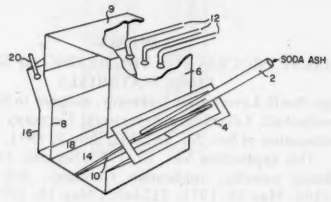
APPARATUS FOR SLURRYING SODA ASH

Lorne E. Weeks, Kenmore, and Ronald W. Doran, Tonawanda, both of N.Y., assignors to Intermountain Research and Development Corporation, Green River, Wyo.

Division of Ser. No. 143,062, May 13, 1971, Pat. No. 3,802,848. This application Dec. 3, 1973, Ser. No. 421,278

Int. Cl. C01d *7/00*; **B01f** *3/12*; **B01d** *5/20*

U.S. Cl. 23—271 R **3 Claims**



1. An apparatus for slurrying soda ash comprising an enclosed housing, an inclined divergent injection nozzle extending through an opening in one side of said housing for dispersing soda ash particles in substantially a flat plane, an inclined splash plate attached along its lower edge to the base of said housing and substantially parallel to and below the plane of soda ash particles introduced through said nozzle, a plurality of liquid spraying means located above said nozzle for dispersing fluid downwardly onto the soda ash particles and splash plate, and an opening in the base of said housing running alone the lower edge of said splash plate to permit the resulting soda ash slurry to exit from the lower end of the splash plate into a storage tank, said storage tank being located directly below and in sealing relationship with said opening.

3,891,394

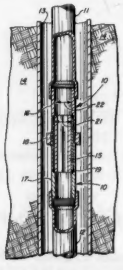
CRYSTAL GENERATOR TO INHIBIT SCALE FORMATION AND CORROSION IN FLUID HANDLING SYSTEMS

Owen Smith, and James F. Holder, both of Scottsdale, Ariz., assignors to Love Oil Company, Inc., Scottsdale, Ariz.

Filed Apr. 10, 1974, Ser. No. 459,548

Int. Cl. B01d *9/02*; **C23f** *13/00*

U.S. Cl. 23—273 R **10 Claims**



1. An apparatus for generating crystals in a fluid flow line to inhibit scale formation and corrosive action comprising: a fluid flow pipe,

a hollow core snugly fitting into said fluid flow pipe in a well having a bore configuration, the internal cross-sectional area of which is less than the cross-sectional area of the fluid flow pipe, said core being formed of an alloy com-

prising substantially 54 to 69 percent of copper, 1 to 23 percent of zinc, 9 to 27 percent of nickel, 0.9 to 11 percent of lead, and 1 to 7 percent of tin,

an insulating sleeve mounted around said core to prevent electrolytic action between said core and said fluid flow pipe,

the upstream end of said core, being mounted in said fluid flow pipe, providing a flange extending inwardly of the surface of the fluid flow pipe in which it is mounted to provide a means for creating a high velocity and turbulence of the fluid as it enters the bore of said core,

said high velocity and turbulence creating an abrupt disturbance which aids in crystal formation in the fluid which are washed away by the violent action of the fluid before additional crystals can grow around the initial crystals and form scale on adjacent equipment surfaces.

3,891,395

CRYSTALLISER WITH INTERGRAL PUMPING MEANS

Robert Winkler, Wallisellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Continuation of Ser. No. 205,142, Dec. 6, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,092

Claims priority, application Switzerland, Dec. 17, 1970, 18692/70

Int. Cl. B01d *9/00*

U.S. Cl. 23—273 **10 Claims**

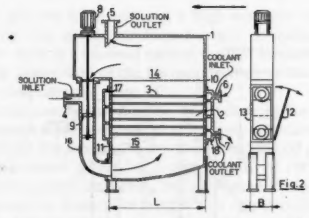


Fig. 2

1. A crystalliser comprising

a. a generally prismatic container including first and second pairs of parallel planar walls which bound a heat exchanger space in the form of a duct of rectangular cross section, portions of the walls of the first of said pairs being formed as tube plates,

b. the container also containing two free spaces at its opposite ends which are enclosed in part by portions of the second of said pairs of walls and which communicate with each other through said duct of rectangular cross section;

c. a plurality of straight, parallel heat exchange tubes extending between said tube plates;

d. conduit means for circulating a coolant through said tubes;

e. duct means, including a pump, interconnecting said end spaces and providing therebetween a second, confined flow path separate from the confined flow path through the heat exchanger space, the duct means and the container spaces defining a definite recirculation loop for solution to be cooled which forces the solution to flow in series through the first end space, the heat exchanger space, the second end space and the duct means, and then return to the first end space; and

f. inlet and outlet passages serving, respectively, to conduct said solution into and out of the container.

3,891,396

ELASTIC HOLDER FOR CERAMIC MONOLITHIC CATALYST BODIES

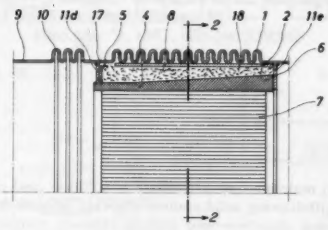
Reimar Musall, and Wilhelm Wolsing, both of Hannover, Germany, assignors to Kali-Chemie AG., Hannover, Germany

Filed Feb. 20, 1973, Ser. No. 333,714

Claims priority, application Germany, Feb. 29, 1972, 2209487; Feb. 29, 1972, 2209488

Int. Cl. F01n *3/14;* **B01j** *9/04*

U.S. Cl. 23—288 F **3 Claims**



1. An elastic holder, for use in holding a monolithic catalyst body suitable for removing toxic gases from an exhaust gas passage, such holder comprising:

a metallic corrugated tube forming the outer wall of said exhaust gas passage;

a ceramic sleeve having two end portions and being positioned within said corrugated tube surrounding, and being rigidly connected to, said catalyst body;

one end portion of said sleeve being of cylindrical external shape and the sleeve increasing in diameter towards the other end portion;

an annular space defined between said metallic, corrugated tube and said ceramic sleeve filled with ceramic wadding; and

end bearings for said catalyst body composed of annular flanges rigidly secured to said corrugated tube, each flange being disposed near an end portion of said sleeve, said corrugated tube being provided with an initial tension adapted for pressing one of said annular flanges against said ceramic sleeve at the other end portion thereof to restrain sleeve movement in one axial direction, the other flange surrounding the cylindrical end portion of said ceramic sleeve with clearance, whereby the wadding will be compressed and in cooperation with the increasing diameter of the sleeve, will restrain sleeve movement in the opposite axial direction.

3,891,397

CRYSTALLIZATION OF SODIUM CHLORIDE OF REDUCED CALCIUM SULFATE CONTENT IN PRESENCE OF ABOUT 5 TO ABOUT 500 PPM

Howard W. Fiedelman, Woodstock, Ill., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

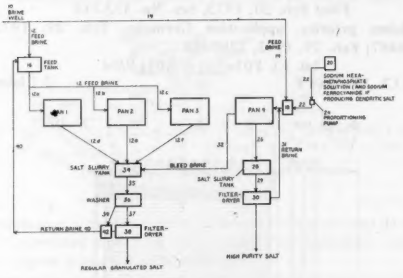
Filed June 19, 1974, Ser. No. 480,615

Int. Cl.² **C01C** *3/06;* **C01D** *3/16*

U.S. Cl. 23—300 **5 Claims**

1. A process for preparing a high purity cubic crystalline sodium chloride having a reduced calcium sulfate content which comprises continuously feeding raw sodium chloride brine containing dissolved calcium sulfate in an amount of from about 0.5 to about 5.5 grams per liter into an evaporating and crystallizing chamber, concentrating and evaporating said brine at an elevated temperature below about 260°F. and at reduced pressure in the presence of no more than from about 5 to about 500 parts per million on a saturated brine basis of an additive consisting of an alkali polyphosphate to produce a crystalline sodium chloride, concomitantly bleeding brine from said evaporating chamber at a rate such that the maxi-

mum calcium sulfate content the brine reaches is from about one and one half to about twice that of its concentration in the raw brine, the rate of feed of raw brine to said evaporating chamber and the rate of bleed of brine therefrom being adjusted to maintain calcium sulfate in solution, and concomitantly withdrawing solid sodium chloride crystals from said evaporating chamber, said sodium chloride containing not more than about 30 ppm of calcium expressed as calcium.



3,891,398

DISC BRAKE PADS FORMED FROM TWO SINTERED METALLIC LAYERS

Jean Odier, Antony, France, assignor to Ferodo Limited, Manchester, England

Filed Jan. 19, 1973, Ser. No. 325,034

Claims priority, application France, Jan. 20, 1972, 72.01843

Int. Cl. B22f 1/00, 7/02, 5/00

U.S. Cl. 29—182.2 15 Claims

1. A monolithic self-supporting disc brake pad consisting essentially of two consolidated layers of sintered metallic powder, wherein (i) a first of said layers forms the friction lining of the pad, (ii) the second of said layers forms the carrier plate of the pad, (iii) the matrix of each layer comprises a sintered wear-resistant metal powder common to both layers, and (iv) the first layer comprises a smaller percentage by weight of the sintered wear-resistant metal powder than the second layer and also comprises a friction enhancing or lubricant additive compatible with the sintered wear-resistant metal powder.

3,891,399

SINTERED GLASS CONTAINING FERROUS MATERIAL

Terence M. Cadle, Coventry, England, assignor to Bries Engineering Ltd., Coventry, England

Filed Aug. 31, 1972, Ser. No. 285,120

Claims priority, application United Kingdom, Sept. 15, 1971, 42961/71

Int. Cl. C22c 1/05

U.S. Cl. 29—182.5 11 Claims

1. A sintered ferrous material made by powder metallurgy, the material including iron in an amount of at least 50 percent by weight and from 0.125 to 0.5 percent by weight of glass.

3,891,400

ALUMINUM VACUUM BRAZING SHEET

Ivan B. Robinson, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 8, 1973, Ser. No. 330,709

Int. Cl. B32b 15/00

U.S. Cl. 29—197.5 6 Claims

1. An aluminum vacuum brazing sheet comprising an aluminum alloy core, clad on at least one side of said core is a layer of an aluminum brazing alloy consisting essentially of about 5–15 percent by weight silicon, about 0.5–5 percent by weight magnesium and the balance aluminum and inconsequential amounts of other elements, and clad on said brazing alloy layer is an essentially magnesium-free aluminum alloy layer, said core and said magnesium-free layer having a liquidus temperature considerably higher than the liquidus temperature of said brazing alloy layer.

3,891,401

REDUCING DEPOSITS AND SMOKE FROM JET FUELS

Roger William Watson, Batavia; John Henry Udelhofen, Glenwood, and Joseph Stephan Strukl, Hickory Hills, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Mar. 1, 1971, Ser. No. 119,865

Int. Cl. C10l 1/24, 1/30

U.S. Cl. 44—68 4 Claims

1. A composition, suitable as a deposit-reducing and smoke-inhibiting additive for jet fuels, comprising methylcyclopentadienyl manganese tricarbonyl and basic calcuim alkylphenol sulfide to provide 80–90 parts by weight manganese and 10–20 parts by weight calcium.

3,891,402

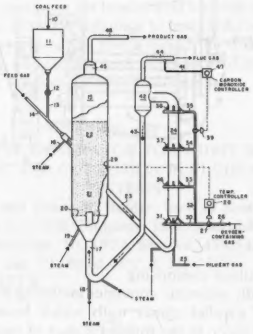
TRANSFER LINE BURNER SYSTEM

Nicholas C. Nahas, and Edward L. Wilson, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 25, 1973, Ser. No. 373,554

Int. Cl. C10j 3/12

U.S. Cl. 48—197 R 5 Claims



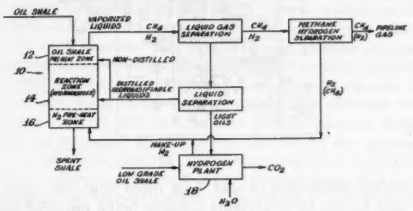
1. In a process wherein a solids stream consisting essentially of carbonaceous particles withdrawn from a fluidized bed reactor is contacted with an oxygen-containing gas in a transfer line burner to burn carbon present in said particles and raise the temperature of said stream, wherein heated particles and combustion gases containing carbon monoxide are withdrawn overhead from said transfer line burner, and wherein said heated particles are separated from said combustion gases and returned to said fluidized bed reactor; the improvement which comprises introducing a first stream of oxygen-containing gas into said transfer line burner at a point near the lower end thereof in a quantity sufficient to initiate the combustion of carbon in said particles, introducing additional oxygen-containing gas into said burner at a second point near the upper end of said burner in a quantity sufficient to burn carbon monoxide present in the combustion gases reaching said second point and generate additional heat, monitoring the carbon monoxide content of the combustion gases withdrawn from said burner, regulating the relative quantities of oxygen-con-

taining gas introduced into said burner at said first point and said second point in response to changes in the carbon monoxide content of said combustion gases withdrawn from said burner, and controlling the total amount of oxygen-containing gas introduced into said burner in response to changes in the temperature in said fluidized bed reactor.

3,891,403
OIL SHALE HYDROGASIFICATION PROCESS

Sanford A. Weil, Chicago; Paul B. Tarman, Elmhurst, and Dharamvir Punwani, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Mar. 9, 1973, Ser. No. 339,547The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.
Int. Cl. C10j *3/06*
U.S. Cl. 48—197 R **10 Claims**



1. A process for producing a high methane content, synthetic pipeline quality gas from kerogen containing oil shale, wherein there is a minimal carbon residue formation resulting from the conversion of the kerogen to the pipeline quality gas which comprises the steps of:

a. continuously flowing the kerogen containing oil shale through a preheat zone at a flow rate sufficient to provide at least ten minutes to gradually heat the oil shale from a temperature of 600° to a temperature of 1000°F.;

b. continuously contacting the oil shale in the preheat zone during the gradual heating with a countercurrently flowing hydrogasification product gas stream as removed from a hereinafter defined hydrogasification zone;

c. said hydrogasification gas stream containing at least stoichiometric amounts of hydrogen to achieve a high hydrogen to oil ratio in the preheat zone;

d. withdrawing a preheated kerogen containing oil shale from the preheat zone and passing the preheated shale to a hydrogasification zone;

e. hydrogasifying, in the hydrogasification zone, the preheated kerogen containing oil shale at a temperature of 1200°–1500°F. in the presence of a countercurrently flowing hydrogen rich gas stream containing at least stoichiometric amounts of hydrogen to achieve a high hydrogen to oil ratio and, to produce hot spent shale and a hydrogasification product gas stream;

f. passing said hydrogasification product gas stream to said preheat zone of step (b) as said hydrogasification product gas stream;

g. maintaining the hydrogen partial pressure in the preheat and hydrogasification zone at a pressure of at least 100 psig.;

h. withdrawing a final product gas stream from said preheat zone comprising hydrogen, volatilized liquid products and gaseous hydrogasification products;

i. separating said final product gas stream into a hydrogen rich gas stream, said high methane content synthetic pipeline gas, a hydrogasifiable liquid distillate fraction and a hydrogasifiable non-distillate fraction;

j. recycling the hydrogen rich gas to said hydrogasification zone;

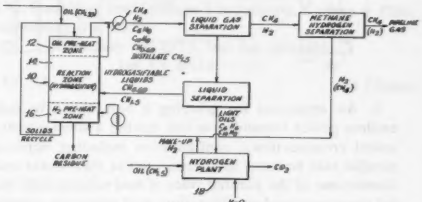
k. passing the hydrogasifiable distillate fraction to the hydrogasification zone; and

l. passing the non-distillate fraction to the preheat zone at a point where the shale is at a temperature of 600°–700°F. whereby a maximum net conversion of kerogen to substitute natural gas is obtained.

3,891,404
HEAVY OIL HYDROGASIFICATION PROCESS

Sanford A. Weil, Chicago; Paul B. Tarman, Elmhurst, and Dharamvir Punwani, Chicago, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Mar. 9, 1973, Ser. No. 339,545
Int. Cl. C10g *13/16*
U.S. Cl. 48—213 **14 Claims**



1. A process for producing a high methane content, synthetic pipeline quality gas from heavy oil, wherein there is a minimal carbon residue formation resulting from the conversion of the heavy oil to the pipeline quality gas which comprises the steps of:

a. continuously flowing absorbent inert solids and the heavy oil through a preheat zone at a flow rate sufficient to provide at least ten minutes to gradually heat the oil from a temperature of 600°F to a temperature of 1000°F.;

b. continuously contacting the heavy oil and solids in the preheat zone during the gradual heating with a countercurrently flowing hydrogen rich gas stream;

c. said hydrogen rich gas stream containing at least stoichiometric amounts of hydrogen to achieve a high hydrogen to oil ratio in the preheat zone;

d. withdrawing preheated inert solids and heavy oil from the preheat zone and passing the preheated solids and heavy oil to a hydrogasification zone;

e. hydrogasifying, in the hydrogasification zone, the preheated heavy oil at a temperature of 1200°–1500°F. in the presence of a countercurrently flowing hydrogen rich gas stream containing at least stoichiometric amounts of hydrogen to achieve a high hydrogen to oil ratio and to produce a gaseous product stream comprising hydrogen, volatized liquid products and gaseous hydrogasification products;

f. maintaining the hydrogen partial pressure in the preheat and hydrogasification zone at a pressure of at least 100 psig.;

g. separating the gaseous product stream produced in the hydrogasification zone to provide a hydrogen rich gas stream, said high methane content synthetic pipeline gas, and a distillate hydrogasifiable liquid fraction and a non-distillate liquid fraction;

h. passing at least a portion of the distillate fraction to the hydrogasification zone;

i. passing at least a portion of the non-distillate fraction to the preheat zone; and

j. withdrawing the inert solids from said hydrogasification zone wherein less than 10% of the carbon in the heavy oil feed is deposited as carbon residue on the withdrawn solids.

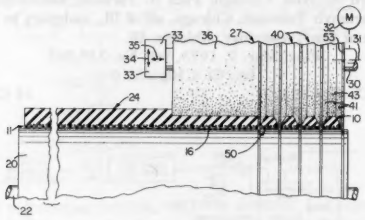
3,891,405
APPARATUS FOR MAKING AN ENDLESS POWER TRANSMISSION BELT

Walter E. Huber, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 310,053, Nov. 28, 1972, Pat. No. 3,882,516. This application Mar. 19, 1974, Ser. No. 452,873

Int. Cl.[2] **B24B** *7/20;* **B29H** *7/22*

U.S. Cl. 51—105 R **6 Claims**



1. An apparatus for grinding a belt sleeve to define an endless power transmission belt having a substantially trapezoidal cross-sectional configuration including opposed non-parallel side portions interconnected at their outer ends by a shorter one of the parallel sides of said substantially trapezoidal cross-sectional configuration; said apparatus comprising a mandrel for supporting a belt construction for rotation about a longitudinal axis; means for rotating said mandrel and belt construction about said longitudinal axis; a rotatable grinding wheel having a pair of substantially identical symmetrically arranged and outwardly diverging integral grinding surfaces with said pair of outwardly diverging integral grinding surfaces having inner edges adjoined by a right circular cylindrical grinding surface, said grinding wheel further comprising a pair of integral disc-like portions each adjoining an outer edge of an associated outwardly diverging integral grinding surface, said disc-like portions being particularly adapted to grind a pair of opposed wall portions in said belt which adjoin a longer one of the parallel sides of said belt; and means for moving said grinding wheel toward and away from said belt construction, said moving means being particularly adapted to urge said grinding wheel during rotation thereof against the rotating belt construction to simultaneously define said belt with said outwardly diverging integral grinding surfaces defining said non-parallel side portions and said right circular cylindrical grinding surface defining the shorter of the parallel sides of said belt.

3,891,406
INNER SURFACE HONING DEVICE WITH WORKPIECE TRANSFER MEANS

Tsutomu Yoshino, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

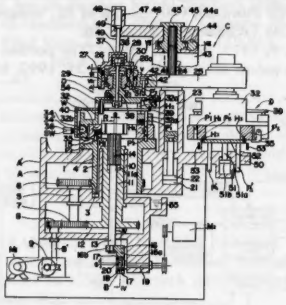
Filed Sept. 16, 1974, Ser. No. 506,049

Claims priority, application Japan, Sept. 22, 1973, 48-107391

Int. Cl. B24b *5/08;* **B65h** *65/00*

U.S. Cl. 51—105 R **4 Claims**

1. An inner surface working device for use in a working machine which comprises a centrally bored work table mounted on a main body so as to be rotatable about a fixed axis of said work table, driving means for rotating said work table, a main shaft which extends through said central bore of said work table and which is equipped with working tool means at an end thereof, driving means for rotating said main shaft, arm means provided adjacent to said work table for supplying a work piece to be worked onto said work table and for removing said work piece which has been worked form said work table, said arm means being provided with work piece attaching and releasing means for clamping and unclamping said work piece to and from said arm means, means for mounting said work piece attaching and releasing means to said arm means so that said work piece attaching and releasing means can be rotated on said arm means about a fixed axis of the former, means for positioning said work piece at a predetermined position on said work table, said positioning means being provided on said work piece attaching and releasing means and also on said work table, and means for preventing rotation of said work piece attaching and releasing means



during positioning of said work piece onto said work table, said means for preventing rotation being provided between said arm means and said work piece attaching and releasing means and adapted to release said work piece attaching and releasing means for allowing rotation of the latter during working operation, whereby said work piece attaching and releasing means rotating together with said work table with said work piece clamped to said work piece attaching and releasing means during working operation.

3,891,407
METHOD FOR GRINDING BEVEL- OR HYPERBOLOID-HAPED GEARS

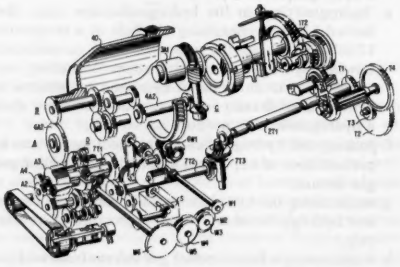
Erich Kotthaus, Kloten, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon Buhrle & Co., Zurich, Switzerland

Filed Oct. 16, 1972, Ser. No. 297,986

Claims priority, application Switzerland, Oct. 21, 1971, 15375/71

Int. Cl. B24b *3/00, 1/00*

U.S. Cl. 51—287 **2 Claims**



1. A method for grinding bevel- or hyperboloid- shaped gears with lengthwise curved teeth with the aid of a grinding head at which there are arranged a number of grinding bodies, said method comprising:

1. Simultaneously carrying out the following steps:

a. rotating the gear to be ground about its own axis;

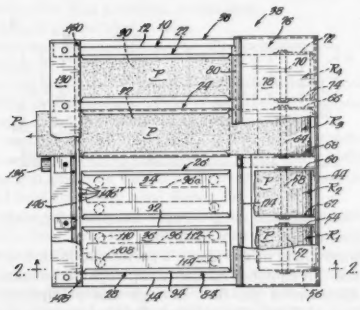
b. rotating the grinding bodies about their own axes;

c. rotating the grinding head about its own axis; and
d. rotating the axis of the grinding head about a stationary axis.

3,891,408
ZIRCONIA-ALUMINA ABRASIVE GRAIN AND GRINDING TOOLS
Robert A. Rowse, Shrewsbury, Mass., and George R. Watson, Chippawa, Canada, assignors to Norton Company, Worcester, Mass.
Continuation-in-part of Ser. No. 287,489, Sept. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 249,204, May 1, 1972, abandoned, and Ser. No. 149,837, June 3, 1971, abandoned. This application Aug. 8, 1973, Ser. No. 386,718
Int. Cl.[2] B24D *3/28;* **C09C** *1/68;* **C09K** *3/14*
U.S. Cl. 51—295 **9 Claims**

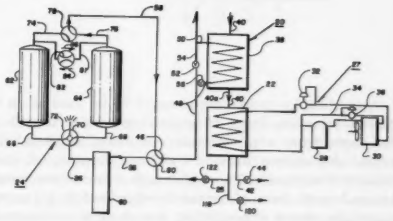
1. Abrasive grits consisting essentially of co-fused alumina-zirconia, said alumina-zirconia abrasive having been solidified from the molten state at least as rapdily as is accomplished by casting molten alumina-zirconia abrasive into a mold filled with 1¾ inch diameter cast iron balls said alumina-zirconia being predominantly in the form of oriented eutectic colonies associated together as grains within said grits, the zirconia in said colonies being in the form of rods and/or platelets, the maximum average rod spacing and platelet spacing being 4000A, as measured at the colony centers by the random intercept technique, and the maximum average size of primary alumina or zirconia crystals, if any are present, being less than 50 microns, the zirconia content of the abrasive being from 35 to 50%, said abrasive grits having the characteristic that they will fracture along and across colony boundaries when subjected to grinding action while partially embedded in a cured thermoset resin, the fracture providing striated or columnar surfaces generally parallel to the long axes of the colonies and stepped fracture surfaces across said long axes.

3,891,409
POLISHING APPARATUS
Marvin W. Keith, Jr., Evanston, Ill., assignor to Buehler Ltd., Evanston, Ill.
Filed Aug. 29, 1974, Ser. No. 501,694
Int. Cl. B24d *17/00;* **B24b** *55/02*
U.S. Cl. 51—361 **10 Claims**



1. In a polishing apparatus of the type where a length of abrasive paper is drawn over a platen to provide a polishing surface for the manual polishing of specimens, the improvement comprising, in combination, clamp means positioned under said platen and having clamp members which overlie edge portions of a length of paper drawn over said platen, expander water bag means disposed under said platen in engagement with said clamp means so that when in its expanded condition said water bag means applies a downward clamping force to said clamp means, water pipe means having at least one spray opening directed at said length of abrasive paper for wetting the same, common water supply means connected with said water pipe means and with said expander water bag means, and control valve means connected with said water supply means, whereby when said control valve means is open said water pipe means will spray water on said abrasive paper and said expander water bag means will be expanded causing said clamp members to clamp said length of paper down against said platen, and when said control valve means is closed siad water pipe means will discontinue spraying and said expander water bag means will collapse relieving the clamping pressure on said length of paper to permit advancement thereof.

3,891,410
DEHYDRATING COMPRESSED AIR AND GASES
Paul M. Hankison, c/o Hankison Corporation, College & Pike, Canonsburg, Pa. 15317
Filed July 30, 1973, Ser. No. 384,006
Int. Cl. B01d *53/04*
U.S. Cl. 55—20 **8 Claims**

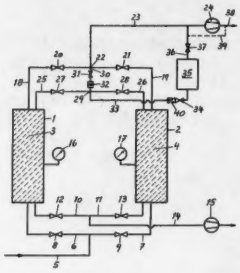


1. An apparatus for dehydrating air or gas, said apparatus comprising a condensor, a refrigerating system coupled to said condensor and capable of supplying a chilled refrigerant liquid thereto, said chilled liquid having an outlet temperature adjacent the freezing point of water, conduit means for conducting said air or gas through said condensor in heat exchange relation with said chilled liquid so that the dew point of said air or gas is reduced to within a few degrees above the freezing point of water, a desiccant dehydrating system coupled to said conduit means downstream of said condensor, said desiccant system being capable of lowering the dew point of said air or gas to a point below anticipated subfreezing temperatures, said conduit means including valved conduit means coupled to said desiccant system and to said condensor and said utilizing system so that the output of said condensor can be coupled selectively through said desiccant system and in by-passing relation thereto in dependence upon the presence of freezing and subfreezing ambient temperatures, a regenerative heat exchanger coupled to said conduit means upstream of said condensor, said conduit means coupling outputs of said desiccant system and of said condensor to said regenerative heat exchanger, a valved outlet conduit coupled to the outlet of said condensor in by-passing relation to said desiccant system and said regenerative heat exchanger for selective or simultaneous removal of low temperature partially dehydrated air or gas from said apparatus.

3,891,411
METHOD AND APPARATUS FOR THE PRODUCTION OF NITROGEN FOR USE AS AN INERT GAS

Georg Michael Meyer, Meerbusch Langst-Kierst, Germany, assignor to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

Filed Dec. 11, 1973, Ser. No. 423,664
Claims priority, application Germany, Dec. 13, 1972, 2260872
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—26 6 Claims



1. A method for producing nitrogen to be used as an inert gas comprising the steps of separating carbon dioxide and water vapor from a gas mixture comprised substantially of nitrogen and carbon dioxide by the adsorption of carbon dioxide in a molecular filter bed in a first one of two parallel-connected tanks, said adsorption being effected at a pressure substantially above atmospheric, desorbing simultaneously a molecular filter bed in the second tank, said desorption being effected at a pressure substantially below atmospheric, admitting a part of the nitrogen leaving said first tank into said second tank for desorbing the filter bed in said second tank, increasing the pressure of said second tank in which desorption is terminated to a pressure level prevailing in said first tank in which adsorption occurs, directing the gas flow to said second tank to effect adsorption in said second tank, directing a part of the nitrogen leaving said second tank into said first tank for desorbing the filter bed in said first tank, and directing the gas flow alternatingly through said tanks to provide for consecutive and alternate adsorption and desorption with the direction of flow in the tanks during desorption being opposite to the direction of flow during adsorption.

3,891,412
TRIMETHYLOLPROPANE USE OF MACRORETICULAR POLYMERS OF TRIMETHACRYLATE FOR MAKING CHROMATOGRAPHIC SEPARATIONS

Shashi Bhaishanker Dave, Lakewood, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed May 6, 1974, Ser. No. 467,165
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 9 Claims

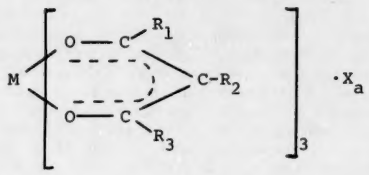
1. A method of separting a mixture of organic compounds into its individual compound components by passing vapors of the mixture through a packed column of porous resin particles, the improvement comprising using porous particles of a polar macroreticular polymer of trimethylolpropane trimethacrylate as the resin particles, at least 65 percent of said particles being of a size that will pass through a 60 mesh screen and be retained on a 120 mesh screen.

3,891,413
SEPARATION OF COMPOUNDS DIFFERING IN ISOTOPIC COMPOSITION

Robert E. Sievers, 2628 N. Emerald Dr., Fairborn, Ohio 45324, and Joseph J. Brooks, 1631 Beaver Ridge Dr., Kettering, Ohio 45429

Filed June 4, 1974, Ser. No. 476,179
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 14 Claims

1. A process for separating organic compounds containing an electron donor group that differ in isotopic composition which comprises the steps of introducing a mixture of the compounds into a chromatographic column containing as a stationary phase a lanthanide chelate having the following structural formula:

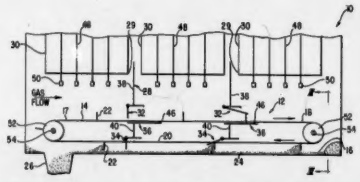


wherein M is a rare earth element of the lanthanide series; R_1, R_2 and R_3 are individually selected from the group consisting of hydrogen, deuterium, alkyl and fluoroalkyl; or R_1 and R_2 together are d-camphor and R_3 is fluoroalkyl; X is water or an organic compound containing a donor group; and *a* is a numeral from zero to 4, inclusive; and withdrawing from the column a stream which is at least enriched with respect to one of the compounds of the mixture.

3,891,414
DRAG SCRAPER ASSEMBLY FOR ELECTROSTATIC PRECIPITATOR

Earle Stuart Snader, Pasadena, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 9, 1974, Ser. No. 513,419
Int. Cl.[2] B03C *3/88*
U.S. Cl. 55—108 6 Claims



1. An improved drag scraper assembly for electrostatic precipitators of the type including:

endless chain means above a particle collection surface of said precipitator having a top flight advancing in the direction of gas flow through said precipitator and a bottom flight advancing in a direction opposite to said gas flow;

scraper means secured to said chain means transverse to the flow of said gas for pushing particles collected on said surface toward a collection hopper for said particles; and baffle means extending between lower portions of adjacent collector electrodes of said precipitator and said particle collection surface for obstructing the flow of gas between said lower portions and said collection surface, a first portion of said baffle means being pivotable by said scraper means advancing with said top flight to permit passage of said scraper means through said baffle means,

a second portion of said baffle means being pivotable by said scraper means advancing with said lower flight to permit passage of said scraper means and said particles through said baffle means,

the improvement comprising:

plate means beneath said first portion of each of said baffle means

for preventing the flow of gas between said first portions and fixed portions of said baffle means during pivotable movement of said first portions.

3,891,415

ELECTROSTATIC DUST COLLECTOR FOR EXHAUST GASES CONTAINING FINE PARTICLES

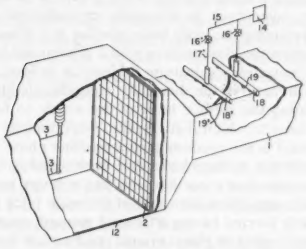
Tamotsu Watanabe, Tokyo, Japan, assignor to Nippon Kogei Kogyo Company, Limited, Tokyo, Japan

Filed Sept. 28, 1972, Ser. No. 292,974

Claims priority, application Japan, Jan. 14, 1972, 47-6500; Feb. 8, 1972, 47-14160

Int. Cl. B03c *3/01*

U.S. Cl. 55—122 **5 Claims**



1. An electrostatic dust collector for treating exhaust gas containing fine dust particles, comprising:

an exhaust gas passage means;

at least one charged electrode wire connected to a high-voltage D.C. generator;

a pair of insulator members supporting said at least one charged electrode wire in a substantially horizontally disposed relation within said exhaust passage;

said passage means including a dust collecting electrode maintained at earth potential and facing said at least one charged electrode wire so as to form an electrostatic field and dust collecting zone therewith;

particle aggregating electrode means forming an electrostatic field with the changed electrode transversely arranged within said exhaust gas passage and positioned far enough upstream of said charged electrode that the electrostatic intensity between said at least one charged electrode wire and said dust collecting electrode is greater than the electrostatic intensity between said at least one charged electrode wire and said particle aggregating means; and

a humidifying means including a liquid supply, means for spraying said liquid in the form of a mist through a plurality of nozzles connected to said supply and means for controlling the quantity of mist being sprayed connected to the nozzles, said nozzles being disposed upstream of said particle aggregating means in said passage means for humidifying the surfaces of said fine dust particles of said exhaust gas before said exhaust gas passes through said aggregating means.

3,891,416

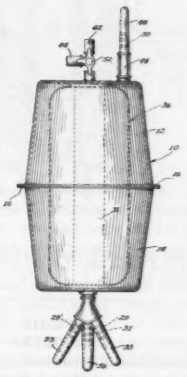
CARDIOTOMY RESERVOIR

Ronald J. Leonard, Elk Grove Village, and Jonathan Wayne Takagishi, Arlington Heights, both of Ill., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed July 20, 1973, Ser. No. 381,311

Int. Cl. B01d *19/02, 35/00*

U.S. Cl. 55—178 **9 Claims**



1. A reservoir for the collection, purification and storage of blood during surgical procedures, which comprises: a hollow blood storage casing having a first port positioned at one end thereof; a generally rigid, hollow member positioned within said casing and extending from end-to-end thereof, said hollow member having a bore positioned to communicate at one end thereof with said first port, said hollow member having a wall defining perforations for the flow of blood through said wall between the interior and exterior of said hollow member; said hollow member also carrying filter means for the purification of blood, a second port communicating through the casing, exterior to said hollow member, whereby a blood flow path is defined through said first port, said hollow member and filter means, and said second port; and a vent port defined at an end of said casing opposite to said one end, said vent port being in position to communicate with the bore of said hollow member at said end opposite said first port, to directly vent gas bubbles passing into said bore through said first port.

3,891,417

FILTER AND SORBENT CARTRIDGE

William D. Wade, Chelsea, Mich., assignor to King Engineering Corporation, Ann Arbor, Mich.

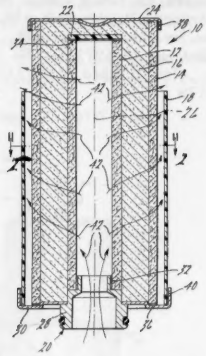
Filed Jan. 28, 1974, Ser. No. 437,467

Int. Cl. B01d *50/00*

U.S. Cl. 55—274 **18 Claims**

1. A filter cartridge for filtering a liquid contaminant from a gaseous fluid, comprising: a first tubular element formed of a filter medium capable of filtering said contaminant; a second tubular element formed of a filter medium capable of filtering said contaminant and surrounding and spaced from said first tubular element; an oil sorbent medium disposed in the annular space between said two tubular elements, both tubular elements being of substantially thickness integrally formed and of sufficient rigidity to support said sorbent medium, and comprising glass microfibers bonded together by a binder; a first sealing closure of one end of said filter cartridge; a second sealing closure at the other end of said cartridge; and a central entrance tube extending through said second sealing closure

and communicating with the interior of said first tubular element, whereby the gaseous fluid to be filtered will enter said



interior and pass outwardly through said tubular elements and sorbent medium.

3,891,418

GAS FILTER

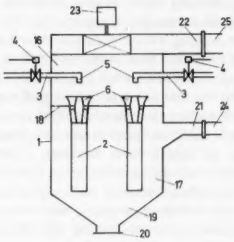
Hans Burger, and Hans Riester, both of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Dec. 6, 1973, Ser. No. 422,290

Claims priority, application Switzerland, Dec. 7, 1972, 17810/72

Int. Cl. B01d *46/04*

U.S. Cl. 55—302 **20 Claims**



1. A gas filter with at least one filter element having an outlet, a clean gas outlet sleeve connected to said outlet of said filter element extending axially of said filter element, a flushing gas device with at least one flushing gas nozzle arranged above said outlet sleeve to introduce a pressurized back flushing gas surge through said outlet sleeve into said outlet of said filter element for cleaning it, wherein the improvement comprises that the smallest cross section of said sleeve transversely of its axis is at least equal to the flow cross section at the connection of said sleeve to said filter element, a hollow guide sleeve positioned within and extending in the axial direction of said outlet sleeve, said guide sleeve spaced radially inwardly from said outlet sleeve and dividing the interior of said outlet sleeve into an annular outer space and a central inner space, said guide sleeve having a first opening at one end directed toward said filter element and a second opening at its opposite end directed toward said flushing gas nozzle, said guide sleeve having a cross-sectional shape normal to its axis corresponding to the cross-sectional shape of said filter element, the transverse cross section of said guide sleeve varying between said first and second openings, and said guide sleeve having at least one other opening therethrough intermediate its ends and affording communication between the inner space and the annular outer space within said outlet sleeve.

3,891,419

GLASS-CERAMIC AND PROCESS THEREFOR

George A. Simmons, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 558,238, June 17, 1966, abandoned. This application May 17, 1971, Ser. No. 144,311The portion of the term of this patent subsequent to Mar. 3, 1987, has been disclaimed.

Int. Cl. C03c *21/00, 3/22*

U.S. Cl. 65—30 **8 Claims**

1. A process of making an article having a main body portion of glass-ceramic and an integral surface layer of glass-ceramic and having a lower coefficient of linear expansion than that of the main body portion which comprises:

1. forming an article from a thermally crystallizable glass, including at least 1 percent by weight, expressed as soda mole equivalent, of oxide of at least one alkali metal,
2. heat treating the article to in situ thermally crystallize the glass to form a glass-ceramic containing a multiplicity of finely-divided, randomly oriented crystalline species,
3. heating a surface layer of the article to convert the surface layer back to thermally crystallizable glass while maintaining the main body portion as a glass-ceramic,
4. treating the glass surface with a lithium salt ion exchanging material to substitute lithium for at least part of said alkali metal in the thermally crystallizable glass, and
5. heating the surface layer of the article to form a glass-ceramic in which β-eucryptite, β-spodumene or mixtures thereof is the predominant crystalline phase,

whereby the surface layer that is obtained is integral with the main body portion and has a lower coefficient of linear expansion than that of the main body portion, the article formed having a flexural strength greater than the initial article of glass-ceramic, said surface layer obtained having an overall composition substantially identical to that of the main body portion except that

a. the lithia content is at least equal to the lithia content in the overall composition of the main body portion,

b. the content of oxide of other alkali metal, having an ionic radius larger than lithium, is at a maximum equal to the content of that oxide in the overall composition of the glass-ceramic main body portion, and

c. when the layer is a glass-ceramic with a lithia content equal to that of the main body portion the predominant crystal in the crystalline phase of the layer differs from that of the main body portion and provides the lower coefficient of linear expansion of the layer.

3,891,420

SHAPING HEAT SOFTENED GLASS SHEETS BY ROLL FORMING

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 2, 1974, Ser. No. 466,343

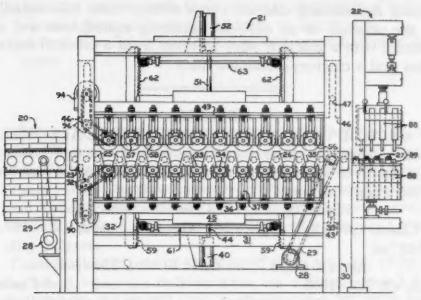
Int. Cl. C03b *23/02*

U.S. Cl. 65—106 **4 Claims**

1. In the method of shaping sheets of heat-softenable material by roll forming wherein a series of heat-softened sheets is conveyed along a predetermined path and each sheet of said series in turn is moved continuously between a pair of sets of segmented forming rolls rotating about axes transverse to said path, each set comprising a series of segmented rolls spaced longitudinally along said path and adapted to engage one or the other major surfaces of said sheet and each roll in one of said sets corresponding to a roll of complementary curvature in the other of said sets, and providing said sets with relative motion toward one another while said sheet is moving therebetween to engage said moving sheet in sandwiching position

between said sets of rotating forming rolls for sufficient time to impart the shape of said rolls onto said sheets,

the improvement comprising independently controlling the rate of rotation of a preselected segment of the rolls of one set and independently controlling the rate of rotation of a corresponding preselected segment of the rolls of the



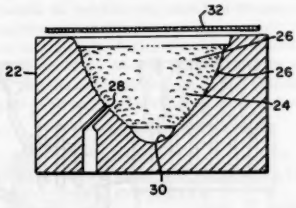
other set in such a manner that the absolute sum of the differences in average peripheral speed of corresponding segments of opposing sets of rotating segmented forming rolls that engage the opposite surfaces of said glass sheet is kept sufficiently low to avoid observable scuff marks in the roll-formed sheet.

3,891,421

METHOD OF MAKING A CONTROLLED-DIFFUSION STIPPLED REFLECTOR BY SAG MOLDING

Robert E. Levin, South Hamilton, Mass., assignor to GTE Sylvania Incorporated, Salem, Mass.

Division of Ser. No. 319,321, Jan. 3, 1973, Pat. No. 3,825,742.
This application Aug. 23, 1973, Ser. No. 390,871
Int. Cl. C03b *23/02*
U.S. Cl. 65—107 **9 Claims**



1. A method of making a stippled reflector for providing controlled diffusion of light, said method comprising:

providing a preheated concave mold having a stippled surface, said stippling on said mold surface comprising a pattern of localized zones of a change in the radius of curvature of the surface of said mold with respect to the large scale concave curvature thereof;

placing a flat blank of rigid material across the opening of said preheated mold, said material being of a type which may be heated to a plastic state for forming;

heating said material to a plastic state;

forcing said plasticized material to sag against the stippled surface of said mold without tools, whereby said material is formed to have an untooled concave surface with stippling thereon;

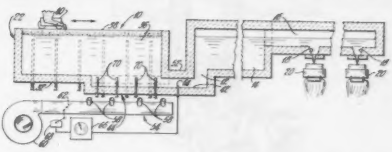
permitting said sag-molded material to cool to a rigid state; and applying a coating of reflective material on the stippled concave surface of said sag-molded material.

3,891,422

ELECTRICALLY-HEATED MELTING FURNACE WITH MELT COOLING MEANS

Magnus L. Froberg, Granville, and Robert F. Jackson, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 22, 1974, Ser. No. 445,036
Int. Cl. C03b *5/22*
U.S. Cl. 65—137 **9 Claims**



1. A furnace for melting a heat-softenable material, said furnace comprising a tank for holding molten material formed by a bottom, side walls, and end walls, means for supplying batch material over molten material in the tank, means extending into the molten material below the batch material for supplying heat to the molten material, wall means forming a cooling trough centrally located in the bottom of the tank and extending beyond an end wall thereof to discharge molten material from the tank, said wall means being exposed to ambient conditions below the bottom of said tank to dissipate heat from molten material in said trough, and a plurality of electrodes having portions extending into said trough in contact with molten material therein and having portions extending outside said trough through the tank bottom and in contact with moving cooler air thereunder, said electrodes being made of material which is capable of conducting heat away from molten material in said trough to ambient conditions below said tank bottom.

7. A method of operating an electrically-heated, melting furnace comprising establishing a pool of molten material, supplying batch material onto the surface of the pool to establish a layer of batch thereover, heating the molten material below the batch layer, collecting molten material in a trough below the pool, directing the molten material toward a location beyond the pool, cooling the molten material in the trough by projecting a heat-conducting body into the trough from a location outside the trough, and directing a cooling medium into heat-exchange relationship with the portion of the heat-conducting body located outside the trough.

3,891,423

SUBSTRATE HAVING A SLIGHTLY WATER SOLUBLE BINDER AND A HERBICIDE FOR RETARDING WEED GROWTH OVER A LONG PERIOD OF TIME

Leonard A. Stanley, and Loyd G. Kasbo, both of Charlotte, N.C., assignors to The Kendall Co., Walpole, Mass.

Continuation of Ser. No. 222,542, Feb. 1, 1972, abandoned.
This application Feb. 25, 1974, Ser. No. 445,432
Int. Cl. A01n *9/36*
U.S. Cl. 71—86 **1 Claim**

1. In a weed growth retardant product for woody plants individually growing in containers of soil, comprising:

a sheetlike water-permeable fabric substrate adapted to fit within a container on the surface of the soil therein about the stem of a plant therein, the improvement comprising having adherent to said substrate a very slightly water soluble film-forming binder containing a pre-emergence herbicidal agent,

said binder being selected from the group consisting of vinyl based polymers, insolubilized carbohydrates, aminoplast resins, insolubilized proteins, polyesters, polyethers, polyamides, polyurethanes, and mixtures thereof,

said herbicide being selected from the group consisting of S-(O, 0-diisopropyl phosphorodithioate) of N-(2 mercap-

toethyl) benzenesulfonamide,; 2,3-dichloroallyl, N,N-diisopropylthiolcarbamate; tributyl, 2,4-dichlorobenzylphosphonium chloride; 3-(3,4-dichlorophenyl)1-methoxy-1-methylurea; 2-chloro-4-ethylamino-6-isopropyl-amino-1,3,5-triazine; N-(3-chloro-4-methylphenyl)-2-methyl-pentanamide; 3-amino-2,5-dichlorobenzoic acid; 4,6-dinitro-o-secbutylphenol alkanolamine salts; 1-

(2-methyl cyclohexyl)-3-phenyl urea; 3-(hexahydro-4,7-methanoindan-5-yl)-1,1-dimethylurea; 4-methylsulfonyl-2,6-dinitro-N,N-dipropylaniline; α,α,α,-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine,

said herbicidal agent being released at a slow rate over a period of several months to prevent weed growth during plant development.

3,891,424

HERBICIDAL 1-CARBONAMIDOTHIO-3-ARYL UREAS

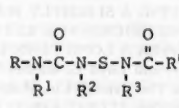
Melancthon S. Brown, deceased, late of Berkeley, Calif., and by Gustave K. Kohn, special administrator, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 88,229, Nov. 9, 1970, Pat. No. 3,824,281. This application Dec. 17, 1973, Ser. No. 425,672

Int. Cl. A01n *9/12*

U.S. Cl. 71—98 **18 Claims**

1. A method for controlling the growth of undesirable vegetation which comprises applying an herbicidally effective amount of a urea of the formula



wherein R is phenyl or phenyl substituted with 1 to 4 halogen atoms of atomic number 9 to 35 (fluorine, chlorine or bromine), trifluoromethyl, trichloromethyl, nitro groups, alkyl groups individually of 1 to 4 carbon atoms or alkoxy groups individually of 1 to 4 carbon atoms; R^1 is hydrogen or alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or alkyl of 1 to 4 carbon atoms; R^3 is alkyl of 1 to 10 carbon atoms, alkyl of 1 to 10 carbon atoms substituted with 1 to 4 halogen atoms of atomic number 17 to 35 (chlorine or bromine), cycloalkyl of 3 to 10 carbon atoms or cycloalkyl of 3 to 10 carbon atoms substituted with 1 to 4 halogen atoms of atomic number 17 to 35; R^4 is hydrogen, alkyl of 1 to 10 carbon atoms, alkyl of 1 to 10 carbon atoms substituted with 1 to 4 halogen atoms of atomic number 17 to 35, cycloalkyl of 3 to 10 carbon atoms or cycloalkyl of 3 to 10 carbon atoms substituted with 1 to 4 halogen atoms of atomic number 17 to 35.

3,891,425

DESULFURIZATION OF TRANSITION METAL ALLOYS

Michael McCarty, New Hartford, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,447

Int. Cl. C22d *7/00;* **C21c** *7/10*

U.S. Cl. 75—10 V **7 Claims**

1. A process for desulfurizing a transition metal alloy comprising maintaining said alloy in a molten state, substantially in the absence of an oxygen-containing atmosphere and in contact with a calcium alloy selected from a calcium-nickel alloy and a calcium-aluminum alloy.

3,891,426

METHOD OF MAKING COPPER-NICKEL ALLOYS

Wolfgang Stawicky, and Horst Ossig, both of Altena, Germany, assignors to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Germany

Filed Aug. 12, 1974, Ser. No. 496,905

Claims priority, application Germany, Aug. 11, 1973, 2340766

Int. Cl. C22d *7/06;* **C21c** *7/10;* **C22c** *1/00*

U.S. Cl. 75—10 R **5 Claims**

1. A process for the production of a copper-nickel alloy comprising the steps of:

smelting nickel oxide with addition of graphite in an electric-arc furnace and adjusting the addition of graphite until the resulting melt has a carbon content of about 0.5% by weight;

superheating the melt to a temperature of about 1700°C; and

introducing preheated copper into the superheated melt.

3,891,427

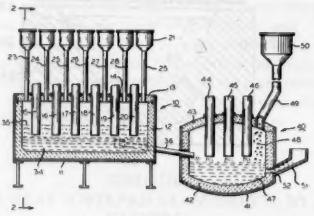
METHOD FOR MELTING PREREDUCED ORE AND SCRAP

John A. Persson, Gibsonia, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1972, Ser. No. 296,908

Int. Cl. C22d *7/04*

U.S. Cl. 75—12 **5 Claims**



1. A continuous steel making process comprising the step of:

providing a first electric furnace having a plurality of electrodes,

feeding into said first electric furnace a quantity of prereduced ore which comprises a major portion of elemental iron and minor portion of gangue that has a low concentration of iron compounds and that is meltable to produce electrically resistive slag,

energizing said electrodes to melt said ore,

forming a layer of molten metal at the bottom of said furnace and a layer of molten slag on the top of said metal layer,

immersing the end portions of said electrodes in said slag layer and spaced from said molten metal layer, passing electric current from said electrodes through said electrically resistive slag layer to generate heat which is substan-

tially confined to the highly resistive path provided by said slag,

feeding additional prereduceed ore into said slag layer and melting the same whereby the metallic portion thereof passes through said slag into said molten metal layer and the gangue portion of said prereduced ore becomes a part of the slag, and

conducting a quantity of said molten metal from said first furnace and beneath the slag layer thereof to a second electric furnace having a plurality of electrodes,

and further refining said metal in said second electric furnace.

3,891,428

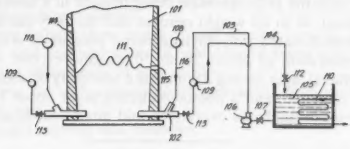
METHOD FOR TREATING NON-FERROUS METAL SLAG

Yordan Todorov Yordanov; Georgi Ivanov Abrashev; Georgi Tenev Georgiev; Velyo Dimitroy Zhekov; Yancho Hristov Yanev; Ivan Georgiev Rossenov; Velcho Angelov Prodanov, and Yordan Todev Roussey, all of Plovdiv, Bulgaria, assignors to Kombinat Za Zvetni Metali "Dimiter Blagoev", Plovdiv, Bulgaria

Continuation-in-part of Ser. No. 67,286, Aug. 26, 1970, abandoned, which is a division of Ser. No. 625,850, March 24, 1967, Pat. No. 3,608,881. This application Oct. 30, 1972, Ser. No. 302,565

Int. Cl. C21b *3/04*

U.S. Cl. 75—24 **8 Claims**



1. A method of treating non-ferrous slag in a furnace, said method comprising heating and reducing molten slag by injecting liquid fuel and air into the slag, said injecting of liquid fuel and air including the steps of discharging a liquid fuel reduction agent under a pressure of at least 12 atmospheres through a nozzle to produce an atomized stream of the fuel forming a narrowing annular passageway coaxially around the outlet of said nozzle, introducing the thus atomized stream of fuel into a stream of air in said passageway for mixing the stream of air and the atomized stream of fuel and carrying the mixed streams of air and fuel into the slag as a reducing agent.

3,891,429

METHOD FOR SELECTIVE DECARBURIZATION OF ALLOY STEELS

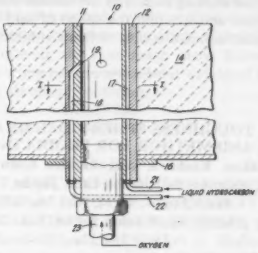
Gordon L. Cox, Mount Lebanon, and Olin E. Williams, Fox Chapel, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed June 7, 1973, Ser. No. 367,839

Int. Cl. C21c *5/34*

U.S. Cl. 75—60 **4 Claims**

1. A method of selective decarburization of a chromium-alloy steel melt, said decarburization being carried out in a refining vessel having at least one double tuyere submerged below the surface of the melt, said method comprising: injecting into said melt through a central tube of said tuyere a gas selected from the group consisting of oxygen and a mixture of oxygen and fuel oil for a period of time sufficient to reach the carbon-chromium-temperature equilibrium, while injecting, during the entire said period, fuel oil maintained in the liquid state to the tuyere-melt interface into said melt through said tuyere and peripherally of said central tube; injecting through said central tube into said melt a mixture of fuel oil and oxygen in a volumetric gas ratio of from about 2:1 to 6:1, until said melt is decarburized, while continuing said peripheral flow of fuel oil into said melt; and thereafter discontinuing the injection of fuel oil and said mixture of fuel oil and oxygen,



and injecting into said melt an inert gas to purge the melt of hydrogen.

3,891,430

RECOVERY OF LEAD

Ernest R. Cole, Jr.; Waldemar M. Dressel, and Lawrence L. Smith, all of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 25, 1973, Ser. No. 371,019

Int. Cl. C22b *13/00*

U.S. Cl. 75—77 **2 Claims**

1. A process of recovery of lead from a lead sulfide-containing material comprising (1) vaporization of lead sulfide at a temperature of about 900° to 1200°C in a first reaction zone, (2) separation of the vaporized lead sulfide from said reaction zone and (3) vapor phase reduction of the lead sulfide with hydrogen at a temperature of about 750° to 1200°C in a second reaction zone to form metallic lead and hydrogen sulfide.

3,891,431

METHOD OF(AND APPARATUS FOR(CONTROLLING THE CRYSTALLINE STRUCTURE OF ALLOYS, AND ALLOYS SO PRODUCED

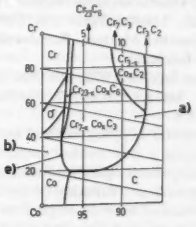
Peter Sahm, Nussbaumen, and Renata Sebalj-Novosel, Neuenhof, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Apr. 17, 1972, Ser. No. 244,652

Claims priority, application Switzerland, May 10, 1971, 6882/71

Int. Cl. C22c *19/00, 33/00, 1/00*

U.S. Cl. 75—122 **3 Claims**



1. In a method of controlling by heat treatment the crystalline structure of an at least partially eutectic alloy having a crystalline $(Cr, Me)_7C_3$ phase embedded in a Me-chromium-carbon matrix phase, wherein Me is selected from the group consisting of Fe, Co, Ni, Mn and combinations thereof, wherein one of said phases is at least substantially isotropic, and the other phase is characterized by a highly anisotropic crystalline structure, the improvement comprising symmetriz-

ing said structure by passing said body through a melting zone and a solidification zone, wherein the temperature gradient between the melting zone and the solidifcation zone is at least 2,500°C/cm, and wherein the speed of said body is advanced through said zones is a rate of from 1–100cm/hr.

3,891,432

HIGH TOUGHNESS SPHEROIDAL GRAPHITE CAST IRON AND METHOD FOR PRODUCING THE SAME

Hideo Nakae, Kashiwa, and Akihiro Goto, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 4, 1974, Ser. No. 430,681
Claims priority, application Japan, Jan. 24, 1973, 48-9530
Int. Cl. C22c *37/04*
U.S. Cl. 75—130 R **13 Claims**

1. A high toughness spheroidal graphite cast iron which comprises, by weight, 3.2–4.0% of C, 2.0–3.8% of Si, not more than 1.0% of Mn, not more than 0.1% of a spheroidizing element, 0.0035–0.02% of N and the balance Fe and incidental impurities, said cast iron having a matrix structure which comprises ferrite and pearlite.

3,891,433

INDUCTION-TYPE REACTION RAILS FOR HIGH SPEED TRAINS

Heinz F. Bichsel, Neuhausen am Rheinfall; Peter Furrer, Neunkirch, both of Switzerland, and Jorg Maier, Steisslingen, Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 12, 1974, Ser. No. 441,761
Claims priority, application Switzerland, Feb. 16, 1973, 2323/73
Int. Cl. C22c *21/00, 21/02;* **C22f** *1/04*
U.S. Cl. 75—147 **8 Claims**

1. Induction-type reaction rail which can be easily shaped and welded and has a high electrical resistance, for use in conjuction with linear motors which power high speed trains, characterised in that the reaction rail is made out of an alloy with the composition 0.7–3.5 % Mn, the rest being aluminium which has a purity of at least 99.5 % in particular with a maximum impurity content of 0.1 % Fe and 0.15 % Si.

3,891,434

POROUS MATERIAL IN A LIQUID DEVELOPMENT METHOD

Herbert Taege, Oberheidkamperstrasse, Bergisch-Gladbach; Friedrich Flus, Lindenstrasse 28, 5161 Merzenich Krs. Duren, and Gunther Mertens, Buchloerstr. 26, Kaufbeuren, Allgau, all of Germany

Filed Dec. 8, 1972, Ser. No. 313,295
Int. Cl. G03g *13/10, 13/22*
U.S. Cl. 96—1 LY **4 Claims**

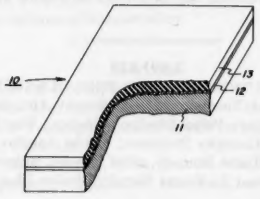
1. An electrostatic copying method including the steps of negatively charging a zinc oxide coated side of a substrate, thereafter partially discharging said zinc oxide coated side in accordance with and as a function of the light intensity of an optical image obtained from an original to be copied, contacting said zinc oxide coated side with a fabric and submerging said substrate and said fabric in contact with said substrate in a developer which includes a carrier liquid and positively charged toner particles to tone certain zones of said zinc oxide coated side and to leave other untoned zones of the substrate, thereby to supply said zinc oxide coated side with toner particles from a portion of the fabric overlying a given zone of said zinc oxide coated side and substantially to prevent the attraction of toner particles from other portions of the fabric whereby substantially uniformly toned zones are obtained, said fabric being formed of a material which has a slight negative charge relative to said developer with which it is soaked.

3,891,435

HETEROPHASE ADHESIVE COMPOSITIONS CONTAINING CHLOROSULFONATED POLYETHYLENE FOR METAL-SELENIUM COMPOSITES

Lieng Huang Lee, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 17, 1973, Ser. No. 389,283
Int. Cl. G03g *5/04*
U.S. Cl. 96—1.5 **12 Claims**



1. A xerographic member which comprises a conductive substrate having thereon an interfacial barrier layer having a thickness of about 0.5 to 3.0 microns, said barrier layer comprising a polymer blend or mixture of a polycarbonate, a polyether-ester-urethane, and a chlorosulfonated polyethylene, with the polycarbonate being present in a concentration of about 30 to 80 weight percent and the poly-urethane and chlorosulfonated polyethylene being present in a combined concentration of about 20 to 70 weight percent, with said interfacial layer having a composite resistivity of about 10^{11} to 10^{14} ohm-cm., and a photoconductive layer about 10 to 200 microns in thickness overlaying said interfacial layer.

3,891,436

BLEACHED PHASE HOLOGRAMS AND METHOD OF PRODUCING THE SAME

Nobuo Nishida, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,770
Claims priority, application Japan, Mar. 1, 1972, 47-21859; May 31, 1972, 47-54475; May 31, 1972, 47-54479; June 1, 1972, 47-54938; Aug. 4, 1972, 47-78529
Int. Cl.[2] G03C *5/04, 5/32*
U.S. Cl. 96—27 H **1 Claim**

1. A method of producing a bleached phase hologram comprising the steps of:

exposing a silver halide photographic film to an interference pattern formed between an object light beam and a reference light beam, and developing and fixing the pattern on said photographic film material,

contacting said photographic film with an aqueous solution of potassium ferricyanide thereby forming silver ferrocyanide on said film, and then immersing said photographic film in a solution containing a mixture of a first aqueous solution of a metal nitrate selected from the group consisting of nickel, lead, copper and zinc nitrates, a second aqueous solution of potassium citrate, and a third solution of dilute nitric acid, thereby producing a bleached phase hologram.

3,891,437

METHOD OF MAKING CUTTING AND SCORING DIES

Albert J. Sarka, Cleveland, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 159,961, July 6, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,614
Int. Cl. G03f *7/00;* **C23f** *1/02*
U.S. Cl. 96—36.3 **11 Claims**

1. The met'iod of providing a parallel-sided and longitudinally extending linear land on the surface of a chemically-

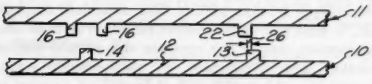
etchable homogeneous metallic member wherein the areas on each side of the land are to be etched downwardly and to a depth which inherently results in side-etching including the steps of:

providing said metallic member with a planar surface,

providing a thin transparent backing sheet with an opaque scribable surface thereon,

scribing a longitudinally extending linear line of a first width in said scribable surface with a scribing tool to produce a first transparency,

placing said scribed transparency in contact with an unexposed film sheet and exposing said film sheet while moving said first transparency and film sheet relative to each



other to produce a second transparency having a linear and longitudinally extending exposed area with a width which is greater than said first width and the width of the linear land to compensate for side-etching which results from achieving the desired etching depth below the surface of said metallic member,

providing said planar surface with a light-hardenable sensitized coating material,

exposing to light those areas of said coating corresponding with said exposed areas of said second transparency to harden those areas of said coating,

removing the unhardened coating material from said surface, and

chemically etching said member.

3,891,438

AQUEOUS DEVELOPING COMPOSITION FOR LITHOGRAPHIC DIAZO PRINTING PLATES

Leon Katz, Springfield, N.J., and Eugene Golda, Monsey, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Nov. 2, 1972, Ser. No. 303,072

Int. Cl. G03c *5/34*; **G03f** *7/08*

U.S. Cl. 96—49 **4 Claims**

1. A developer composition adapted for developing an exposed diazo-sensitized photosensitive coating on a substrate to remove therefrom non-image areas which comprises an aqueous solution of from 5 percent to 50 percent by weight of the sodium salt of a 2-alkyl-1-(ethyl beta oxipropanoic acid) imidazoline and up to 30 percent by weight of a water-miscible solvent, all percentages being based on the total weight of the ingredients in the developer solution.

3,891,439

AQUEOUS DEVELOPING COMPOSITION FOR LITHOGRAPHIC DIAZO PRINTING PLATES

Leon Katz, Springfield; William Rowe, Westfield, both of N.J., and Eugene Golda, Monsey, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Nov. 2, 1972, Ser. No. 303,071

Int. Cl. G03c *5/34*; **G03f** *7/08*

U.S. Cl. 96—49 **21 Claims**

1. A developer composition for lithographic printing plates which comprises;

a. An aqueous solution comprised of;

1. from 5% by weight to 30% by weight of an amphoteric 2-alkyl substituted imidazoline surfactant with 1-position substitution containing a halogen atom, carboxyl, phosphoric or sulfonic acid group, wherein the alkyl group contains from 6 to 20 carbon atoms; and

2. from 5% by weight to 25% by weight of a water soluble organo-lithium salt, which is the water soluble lithium salt of an organic compound having from 1 to 36 carbon atoms and at least 1 acidic hydrogen; and

b. said aqueous composition having a pH of from about 5 to about 12 and being capable, when applied to an exposed diazo-sensitive photosensitive coating of a lithographic plate, of removing the non-image areas therefrom, all percentages being based on the total weight of the ingredients in the developer solution.

3,891,440

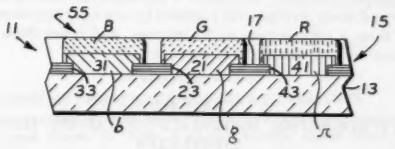
PROCESS FOR FABRICATING A COLOR CATHODE RAY TUBE SCREEN STRUCTURE INCORPORATING OPTICAL FILTER MEANS THEREIN

Anthony V. Gallaro, Auburn, and Robert A. Hedler, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 2, 1973, Ser. No. 412,145

Int. Cl. G03g *13/22*

U.S. Cl. 96—36.1 **8 Claims**



3. In the viewing panel of a color cathode ray tube having diverse phosphors disposed as a plural patterned cathodoluminescent screen upon a multi-windowed webbing of a substantially opaque material formed contiguous to the inner surface of said panel in accordance with a spatially related multiple-apertures pattern mask, a process for disposing a pattern of first optical filter elements in the window areas of said webbing associated with the first pattern of said screen prior to the deposition of the phosphor materials thereon, said process comprising the steps of:

a. coating said panel with a first heat formable optical filter material;

b. heating said coated panel in a controlled oxygen atmosphere to transform and adhere said first optical filter material thereto;

c. coating said panel with a covering of a first acid-resistant negative photosensitive resist material;

d. exposing said coated panel by directing actinic radiation emanating from a first exposure source through the apertures in said pattern mask to light-polymerize first pattern areas thereon;

e. developing said light-exposed coating by removing the unexposed acid-resistant photosensitive resist to provide a primary deposition of polymerized first pattern areas protectively covering areas of said first optical filter material disposed in the first window pattern of said screen webbing;

f. removing the extraneous first optical filter material from those areas not protected by said primary deposition of polymerized said first pattern areas to provide a defined first pattern of optical filter elements therebeneath;

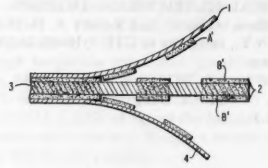
x. heating said panel to volatilize said first pattern of polymerized primary areas to provide a basic screen structure having discrete first pattern optical filter elements associated with the first pattern windows in the webbing of said screen structure.

3,891,441

LIGHT-SENSITIVE STENCIL PRINTING MATERIAL WITH POROUS SUPPORT AND COVER SHEETS

Nobuo Tsuji, and Eiichi Hasegawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Japan

Continuation of Ser. No. 60,233, Aug. 3, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,780
Claims priority, application Japan, Aug. 1, 1969, 44-60807
Int. Cl. G03c 1/76, 3/00, 5/00, 1/90, 1/86, 1/68
U.S. Cl. 96—68 18 Claims



1. A light-sensitive stencil printing material comprising a porous support having impregnated therein a thixotropic photopolymerizable composition containing a thixotropic photopolymerizable monomer, a photopolymerization initiator and finely divided solid particles having a particle diameter of from 5 millimicrons to 50 microns, and cover films provided on both sides of said support.

3,891,442

LITHOGRAPHIC MATERIALS CONTAINING METAL COMPLEXES

Dorothy Johnson Beavers, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 312,159, Dec. 4, 1972, abandoned. This application Sept. 18, 1973, Ser. No. 398,515
Int. Cl. G03c 1/48, 1/06, 1/28
U.S. Cl. 96—76 R 15 Claims

1. A photographic element comprising a support having coated thereon at least one layer comprising a photographic silver halide emulsion and in said layer or in a second layer adjacent thereto from about 0.2 to about 5.0 grams per mole of silver of each of (a) at least one azaindene and (b) at least one hexacoordinated trivalent cationic complex comprising a trivalent metal ion selected from the group consisting of cobalt (III) and chromium (III) in combination with at least one ligand selected from the group consisting of ammonia, ethylenediamine, trimethylenediamine, diethanolamine and dipropanolamine; said silver halide emulsion comprising silver halide grains in which the halide consists of at least about 50 mole percent chloride, up to about 10 mole percent iodide and any remaining halide being bromide.

3,891,443

MAT FINISH PHOTOSENSITIVE RELIEF PLATES

Gregory Halpern, Tarrytown, N.Y., and William Rowe, Westfield, N.J., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,632
Int. Cl. G03c 1/72
U.S. Cl. 96—79 2 Claims

1. A photosensitive plate for the preparation of relief printing plates which photosensitive plate has a layer of a photopolymerizable composition and, in conjunction therewith, a strippable material with a mat or grained surface in intimate contact with the photopolymerizable layer whereby a mirror image mat or grained surface has been imparted to the surface of the photopolymerizable layer, said strippable material being adapted for removal before exposure of the photopolymerizable composition without disturbing the mat surface of the photopolymerizable layer, by being coated, at least on the surface adjacent said photopolymerizable composition, with a release agent.

3,891,444

MOTION PICTURE FILM MATERIALS CONTAINING MAGNETIC RECORDING STRIPES

August Jean Van Paesschen, Antwerp; and Joseph Antoine Herbots, Edegem, both of Belgium, assignors to Agfa-Gavaert Aktiengesellschaft, Mortsel, Belgium

Filed June 3, 1974, Ser. No. 475,934
Claims priority, application United Kingdom, June 4, 1973, 26581/73
Int. Cl. G03c 1/84, 1/72, 1/78, 5/14
U.S. Cl. 96—84 R 6 Claims

1. Multilayer motion picture film material comprising a support, at least one light-sensitive emulsion layer at one side of said support, and at the opposite side of said support an antihalation layer comprising an alkali-soluble polymeric binder capable of being detached from said support in the presence of an alkaline medium, and deposited upon said antihalation layer stripes of a coating composition of magnetizable material dispersed in an alkali-insoluble binder in admixture with a carbodiimide as cross-linking agent for the alkali-soluble polymeric binder of said antihalation layer.

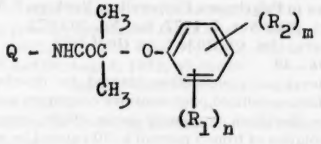
3,891,445

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Atsuaki Arai, and Yasushi Oishi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 18, 1974, Ser. No. 480,456
Claims priority, application Japan, June 20, 1973, 48-69383
Int. Cl. G03c 1/40
U.S. Cl. 96—100 12 Claims

1. A color photographic light-sensitive material which comprises a support having thereon at least one silver halide emulsion layer containing a coupler represented by the general formula



wherein Q represents a coupler residue forming a dye upon reaction with an oxidation product of an aromatic primary amino developing agent; R_1 represents an alkyl group, an aralkyl group, an alkoxy group, an alkoxyalkyl group, an acylamido group or an alkoxycarbonyl group, each having from 4 to 20 carbon atoms; R_2 represents a hydrogen atom, a chlorine atom, a hydroxy group, an alkyl group having from 1 to 5 carbon atoms or an alkoxy group having from 1 to 5 carbon atoms; m represents an integer of 1 to 4; n represents an integer of 1 to 4; and the sum of $m+n$ is 2 to 5; and R_1 and R_2 can form a non-metallic atom-containing five membered ring or a six membered ring.

3,891,446

SENSITIZING SOLID SILVER HALIDE EMULSION LAYER WITH HOT HYDROGEN

Gaile A. Janusonis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 20, 1973, Ser. No. 334,183
Int. Cl. G03c 1/28
U.S. Cl. 96—107 6 Claims

1. A process for increasing the sensitivity of a solid radiation-sensitive negative-forming layer containing at least one

radiation-sensitive silver halide, which process comprises the step of contacting said layer with a gaseous atmosphere containing at least about 2 volume percent of hydrogen and at most about 5 volume percent moisture at a temperature of at least about 35°C. and for at least about 5 seconds until the sensitivity of said layer is increased; said process being performed without subjecting said layer to an evacuation step prior to said contacting with hydrogen; any other gases in said contacting gaseous atmosphere being non-reactive with said layer.

3,891,447

BATH FOR PLATING GOLD ON TITANIUM METAL

George F. Nordblom, Yardley, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Dec. 12, 1973, Ser. No. 424,173
Int. Cl. C23c *3/00*
U.S. Cl. 106—1 2 Claims

1. An aqueous bath for plating gold on metal by displacement which comprises:

a. monovalent gold ion, the concentration of gold ion being between the limits of about 25 gms per liter and about 1 gm per liter;

b. citrate ion, the concentration of citrate ion being about 50 gms per liter;

c. ammonium fluoride, the concentration of the ammonium fluoride being about 7½ gms per liter;

d. ammonium acid fluoride, the concentration of the ammonium acid fluoride being about 6 gms per liter; and

e. tungstic acid, the concentration of the tungstic acid being about 10 gms per liter.

3,891,448

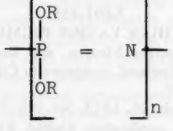
MODIFIED PHOSPHAZENE FLAME RETARDANT

Henry G. Braxton, Jr., Franklin, and U. Albert Lehikoinen, Detroit, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 5, 1973, Ser. No. 337,828
Int. Cl. C09d *5/18*
U.S. Cl. 106—15 FP 10 Claims

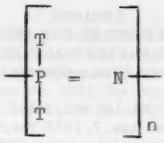
1. Process for the preparation of a modified phosphazene fire retardant, said process comprising reacting a substantially fully hydrocarbyloxylated phosphazene and a partially hydrocarbyloxylated phosphazene; said phosphazene reactants being composed of at least about 65% cyclics and having a number average molecular weight of from about 400 to about 10,000

a. said substantially fully hydrocarbyloxylated phosphazene having the formula



wherein *n* is at least 3, such that the number average molecular weight is as stated above and each R is a hydrocarbyl radical of up to about seven carbon atoms and is selected from the class consisting of alkyl, cycloalkyl, alkenyl, alkaryl, aralkyl, and aryl,

b. said partially hydrocarbyloxylated phosphazene having the formula



wherein each T is selected from the class consisting of chlorine, bromine, and —OR such that from about 80 to about 95 per cent of said T groups are —OR and the remainder is halogen, and wherein R and *n* have the same significance as above; said process being conducted by heating said phosphazenes at from about 90° to about 190°C. such that said modified phosphazene fire retardant is formed by splitting out RX by-product wherein R and X have the same significance as above.

3,891,449

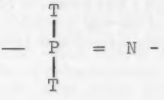
MODIFIED PHOSPHAZENE FIRE RETARDANTS

Henry G. Braxton, Jr., Franklin; Margaret E. Griffing, Southfield, and James G. Jolly, Lathrup Village, all of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 5, 1973, Ser. No. 338,145
Int. Cl. C09d *5/18*
U.S. Cl. 106—15 FP 9 Claims

1. A modified phosphazene having at least two entities crosslinked by a P—O—P bond, said modified phosphazene being characterized by having less than about 38 weight percent cyclics, and further characterized by being the reaction product formed by heating, until organic halide is evolved,

a. an organophosphazene with a reactant selected from the class consisting of (b) a phosphonitrilic halide, and (c) a partially substituted, halogen-containing phosphazene, each of (a), (b), and (c) being characterized by having less than about 38 weight percent cyclics, and (b) having a number average molecular weight of from about 900 to about 400,000, and (a) and (c) being derived therefrom, each of (a), (b) and (c) having the repeating unit



such that in

a. each T is a hydrocarbyloxy radical —OR wherein R is a hydrocarbyl radical of up to about 7 carbons selected from the class consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl; in

b. each T is selected from the class consisting of chlorine and bromine; and in

c. each T is selected from the class consisting of chlorine and bromine and —OR wherein R is the same as above, such that from about 80–95 percent of said T groups are —OR and the remainder is halogen;

the amount of said reactant being such that the weight percent of halogen in the reaction mixture is from about 2 to about 20 weight percent.

3,891,450

SOLVENTS AND VEHICLES FOR MICRO-CIRCUITRY PASTES AND PASTES MADE THEREFROM

Ralph E. Trease, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 159,452, July 2, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 347,311

Int. Cl. C08h *17/34, 17/66;* **C09d** *11/14*

U.S. Cl. 106—26 **10 Claims**

1. A printing paste comprising by weight:

a. about 26% of a liquid carrier vehicle consisting essentially of a liquid solvent system consisting essentially of polypropylene glycol and butyl carbitol acetate and ethyl cellulose dissolved therein; and

b. about 74% of a particulate solids component consisting essentially of a glass binder consisting of about 75% by weight of a lead-borosilicate glass and about 25% by weight Bi_2O_3 and a conductor material comprised of Ag, said solids component consisting essentially of by weight about 82% of said conductor material and about 18% of said glass binder.

3,891,451

THERMOPLASTIC TRAFFIC PAINT

Hiroyuki Okazaki; Isao Yuji, both of Toyonaka, and Masayuki Yui, Ikoma, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Mar. 13, 1974, Ser. No. 450,683

Claims priority, application Japan, Nov. 1, 1973, 48-123643

Int. Cl. C08f *45/66;* **E01f** *9/08*

U.S. Cl. 106—30 **6 Claims**

1. In a thermoplastic traffic paint containing at least one pigment, at least one filler and at least one natural and/or synthetic resin, an improvement which comprises using as the pigment an aged product obtained by heating 4,4′-bis-[acetoacet(2″,5″-dimethoxy-4″-chloro)anilido-2-azo]-3,3′-dichlorodiphenyl in an organic solvent or an aqueous alkali solution, under atmospheric or increased pressure.

3,891,452

REFRACTORY PORCELAIN ENAMEL PASSIVE CONTROL COATING FOR HIGH TEMPERATURE ALLOYS

George M. Low, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Herman Levin, Canoga Park; Byron H. Auker, Hermosa, and Michael N. Gardos, Torrance, all of Calif.

Filed Apr. 11, 1973, Ser. No. 350,250

Int. Cl. C03c *7/00, 3/14*

U.S. Cl. 106—48 **5 Claims**

1. A porcelain enamel coating composition which exhibits a low absorptance and a high emittance of solar radiation and a high coefficient of thermal expansion, and maintains its physical integrity upon subjection to severe thermal cycling, comprising:

a frit comprising:

	Weight Percent
SiO_2	35 to 50
B_2O_3	4 to 9
Al_2O_3	6 to 9.5
ZrO_2	10 to 20
Na_2O	6 to 7
CaO	1 to 2
BaO	8.5 to 9.8
ZnO	2 to 6
LiF	4 to 10.2

and a disperse phase of cubic-stabilized, submicron-particle-size zirconium oxide, the amount of the disperse phase is 10–50 weight percent of said frit.

3,891,453

ASBESTOS-FREE JOINT COMPOUNDS

Terrance L. Williams, Crystal Lake, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed July 26, 1973, Ser. No. 382,973

Int. Cl. C04b *11/16*

U.S. Cl. 106—85 **12 Claims**

1. A composition which when mixed with water forms a non-leveling joint compound having properties suitable for use in finishing joints between wallboards even when free of asbestos fibers, comprising the following ingredients in amounts based on the total dry weight of the composition:

a filler selected from the group consisting of calcium carbonate and calcuim sulfate in an amount of between about 37 and 92 percent;

a binder in an amount of between about 1 and 7 percent;

attapulgus clay in an amount of between about 0.5 and 6 percent; and

at least one ingredient selected from the group consisting of: a water-holding agent in an amount of between about 0.1 and 2.0 percent; and

a slip-inducing colloid in an amount of between about 0.1 and 2.9 percent selected from the group consisting of modified montmorillonite clay gel and xanthan gum.

3,891,454

COMPOSITION AND METHOD FOR CEMENTING WELLS IN LOW TEMPERATURE FORMATIONS

Willis C. Cunningham; Charles R. George, both of Duncan, Okla., and Stanley H. Shryock, Brea, Calif., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 129,983, March 31, 1971, abandoned, which is a continuation-in-part of Ser. No. 821,946, May 5, 1969, abandoned. This application June 28, 1973, Ser. No. 374,609

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—89 **20 Claims**

1. A hydraulic cement composition capable of setting at low temperatures without freezing consisting essentially of:

A Portland cement, gypsum, a monovalent chloride salt, and a setting time retarding agent;

wherein said Portland cement is present in said composition in the range of about 15 to about 35 pounds per 75 pounds of dry solids, the weight ratio of said gypsum to said Portland cement in said composition is in the range of about 1:1 to about 3:1, said monovalent chloride salt is present in said composition in the range of about 1 to about 3.5 pounds per 75 pounds of dry solids, and said setting time retarding agent is present in said composition in the range of about 0.01 to about 0.525 pounds per 75 pounds of dry solids.

3,891,455

PHYTHLOCYANINE PIGMENTS

Robert Langley, Newton Mearns, and Ronald Barraclough, Paisley, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 26, 1973, Ser. No. 336,097

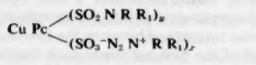
Claims priority, application United Kingdom, Mar. 14, 1972, 11742/72

Int. Cl. C08h *17/14*

U.S. Cl. 106—288 Q **12 Claims**

1. A process for preparing a pigment which comprises incorporating into a metal phthalocyanine green compound, from 5 to 15% by weight of a copper phthalocyanine derivative having either the formula: $CuPc(SO_3H)_{3-4}$ II

or



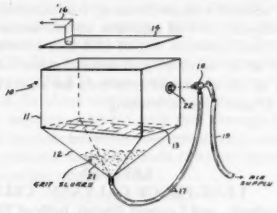
wherein Cu Pc represents a copper phthalocyanine residue, which is halogenated or unhalogenated, R represents a cyclic or acyclic alkyl group having from 1 to 20 carbon atoms, or an aryl group, R_1 represents hydrogen, a cyclic or acyclic alkyl group having from 1 to 20 carbon atoms or an aryl group, the alkyl or aryl groups being either unsubstituted or substituted by hydroxyl, amino, alkylamino or amide substituents, and x and y each represent 1, 2 or 3 with the proviso that the sum of x and y is 2, 3 or 4.

3,891,456

SURFACE TREATMENT OF TITANIUM AND TITANIUM ALLOYS

Alvin E. Hohman, Dallas, and Gerald W. Lively, Arlington, both of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 17, 1973, Ser. No. 407,380
Int. Cl. B08b *3/02*
U.S. Cl. 134—3 **6 Claims**



1. A process for treating an oxidized surface of a titanium or titanium alloy part which comprises directing a stream consisting essentially of a slurry of aluminum oxide grit in an aqueous hydrofluosilicic acid solution onto the surface for a period of time sufficient to obtain about 3 to 15 minutes; washing the surface with water to remove grit and terminate acid reaction; and drying the part. an oxide-free, uniform, matte surface free from gloss, provided that the total period of time the surface is allowed to remain in contact with the slurry is.

3,891,457

ELECTROCHEMICAL CELL

James J. Auborn, Groton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 29, 1973, Ser. No. 420,125
Int. Cl. H01m *43/06*
U.S. Cl. 136—6 LN **26 Claims**

1. An electrochemical cell comprising an oxidizable active anode material; a solid, non-consumable, electrically conducting inert cathode current collector; said anode material being more electropositive than said cathode current collector and thus said anode material is oxidized during operation of said cell; and an electrolytic paste between and in contact with said anode and said cathode current collector, said electolytic paste comprising a liquid, electrochemically reducible, covalent inorganic oxyhalide or thiohalide solvent, a solute dissolved in said solvent, and a sufficient quantity of small carbon particles suspended in said solvent to give the electrolyte paste-like consistency; said carbon particles in said electrolyte paste catalyzing the electrochemical reduction of said inorganic solvent, whereby said inorganic solvent in conjunction with said oxidizable anode material serves as a source of electrical energy during operation of said cell.

3,891,458

ELECTRIC CURRENT PRODUCING GALVANIC CELL

Morris Eisenberg, Mountain View, Calif., assignor to Electrochimica Corporation, Mountain View, Calif.

Filed Nov. 15, 1973, Ser. No. 416,073
Int. Cl. H01m *43/06*
U.S. Cl. 136—6 LN **13 Claims**

1. A galvanic cell comprising:

A. a porous solid cathode;

B. an anode including a metal less noble than zinc selected from the group consisting of lithium, sodium, magnesium, calcium and aluminum; and

C. an electrolyte for electrolytic conduction between said anode and cathode consisting essentially of thionyl chloride in which is dissolved

a. a first solute consisting essentially of a salt of the selected anode metal in a concentration of between 0.5 and 3.0 moles per liter, and

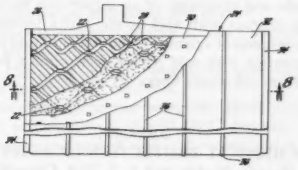
b. a second solute selected from the group of compounds consisting of phosphoryl chloride, sulfolane, sulfur dioxide, and mixtures thereof in a concentration of between 0.5 and 6.0 moles per liter.

3,891,459

NEGATIVE LEAD-ACID BATTERY PLATES WITH EXPANDED LEAD SHEET GRIDS

Charles P. McCartney, Jr., Yorktown, and Norman L. Willmann, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 20, 1973, Ser. No. 399,109
Int. Cl. H01m *35/04*
U.S. Cl. 136—26 **2 Claims**



1. A negative lead-acid storage battery plate of the Faure-type comprising:

a paste-supporting skeleton of lead material defining a flat, top current-collecting header of sheet lead having a predetermined thickness and an upstanding connector lug, a reticulated portion depending from the header over substantially the entire length thereof and including a plurality of nodes from which skeletal elements project to define a plurality of polygonal paste-retaining cells there being significantly more nodes, skeletal elements and paste-retaining cells per unit area of reticulated portion contiguous to the header than in reticulated portions more remote from the header said header-contiguous cells having significantly smaller paste-retaining areas than the cells remote from the header, said nodes angling from one face of the reticulated portion to the other face thereof and having a polygonal cross-section in the vertical transverse plane with two opposing sides of each polygon in planes substantially parallel to the faces of the pasted plate and spaced one from the other by a distance greater than said predetermined thickness but substantially less than twice said predetermined thickness, and said skeletal elements angling from one side of each node to the opposite side of the adjacent node to which it connects; and

a fiber-laden, leady active material paste embedding the reticulated portion of the skeleton and together therewith defining a substantially flat plate having substantially parallel faces and a thickness at least equal to the distance between said opposing sides of said nodes whereby the skeletal elements angle through and are substantially covered by the paste and support the same over substantially the entire thickness thereof without substantially interrupting continuity of the paste from one polygonal paste-retaining cell to the next.

3,891,460

THERMAL BATTERY AND MOLTEN METAL ANODE THEREFORE

George C. Bowser, Baltimore, Md.; James R. Moser, deceased, late of Shrewsbury, Pa., and Patricia Karen Moser, administratrix, Shrewsbury, Pa., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed May 14, 1973, Ser. No. 360,162

Int. Cl. H01m *21/00*

U.S. Cl. 136—83 T **16 Claims**

1. A thermal battery comprising a plurality of stacked cell elements including an anode assembly consisting essentially of an anode having substantially parallel inner and outer surfaces and a side surface, said anode consisting of a foraminous metal substrate wettable by and filled with a metal selected from the group consisting of alkali metals, alkaline earth metals and alloys thereof melting below the operating temperature of the battery, and a housing covering the outer surface and side of said anode and consisting of an impervious metal portion in electrical contact with said anode and a porous portion in sealing engagement against the periphery of said metal portion and in contact with said anode, said porous portion being formed from refractory fibers.

3,891,461

CHEMICAL PROTECTION OF ASBESTOS

Yoshiro Harada, Skokie, and A. Z. Hed, Chicago, both of Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 5, 1973, Ser. No. 404,091

Int. Cl. H01m *27/00*

U.S. Cl. 136—86 E **2 Claims**

1. A method for producing an activatable hydrogen-oxygen type fuel cell characterized by having an operational feasibility over extended periods of time which comprises the steps of:

a. providing said cells with an electrolyte system which comprises a mixture of (1) potassium hydroxide in concentration range of from 40 percent to 60 percent and (2) asbestos fibers for retaining said electrolyte; and

b. adding potassium silicate to said electrolyte system to stabilize the corrosive chemical reaction occurring between said hydroxide and said asbestos at temperatures in excess of 100°C.

3,891,462

GALVANIC CELL STRUCTURE

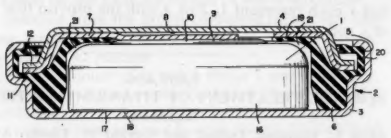
John Frank Langkau, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,883

Int. Cl. H01m *1/00*

U.S. Cl. 136—111 **14 Claims**

1. A galvanic cell structure comprising at least one miniature sized galvanic button cell having an anode, a cathode of depolarizer material and an electrolyte assembled in a first sealed button housing which comprises a first conductive container, a first conductive cover for the container, and a first insulating member interposed between the first cover and the upper inner wall of the first container such that a seal is formed between said first container and said first cover; said at least one button cell disposed in a second housing which comprises a second conductive container, a second conductive cover for the container, and a second insulating member interposed between the second cover and the upper inner wall



of the second container such that a seal is formed between said second container and said second cover; and contact means disposed between at least one of said first button cells and said second button housing for maintaining electrical contact between one of said first containers and said second container, and between one of said first covers and said second cover so as to adopt said second cover and said second container as the electrical terminals for said at least one cell enclosed in said second housing.

3,891,463

LEAK-PROOF GALVANIC CELL

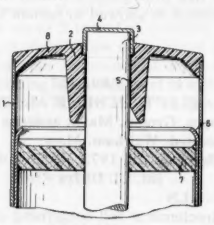
Ernst Karobath, and Leopold Rippel, both of Vienna, Austria, assignors to Telephon-und Telegraphen-Fabriks Aktiengesellschaft Kapsch & Sohne In Wien, Vienna, Austria

Filed Dec. 19, 1973, Ser. No. 426,239

Claims priority, application Germany, Dec. 21, 1972, 2262670

Int. Cl. H01m *1/02*

U.S. Cl. 136—134 R **2 Claims**

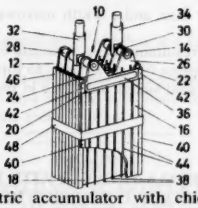


1. A leak-proof galvanic cell comprising a plastic sleeve, a cover on said sleeve having an opening with a surrounding flange, a positive bar electrode disposed in said opening and defining an annular gap with said flange, a sealing material in said annular gap between the flange and the bar electrode, said sealing material consisting essentially of elastomeric atactic polypropylene having a softening range above a temperature of 100°C.

3,891,464
ELECTRIC ACCUMULATOR WITH CHIEFLY PLANE PLATES

Verner Elof Johannes Kinnerud, and Bernt Oskar Gerhard Svensson, both of Oskarshamn, Sweden, assignors to Svenska Ackumulator Aktiebolaget Jungner, Oskarshamn, Sweden

Filed Nov. 7, 1973, Ser. No. 413,742
Claims priority, application Sweden, Nov. 14, 1972, 14787/72
Int. Cl. H01m *39/02*
U.S. Cl. 136—145 **4 Claims**

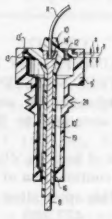


1. In an electric accumulator with chiefly plane plates (16,18) which in their upper part have chiefly plane terminal lugs (20,22) and which are arranged in parallel with alternately placed positive and negative plates with intermediate flexible separator rods (38) which extend up between the terminal lugs (20,22), the improvement characterized in that the terminal lugs (20,22) have one or more portions (36) projecting from the plane surface which subject the separator rods (38) to a bending moment such that through the generated forces of friction between said projecting portions and said separator rods the separator rods (38) are held in a fixed position between the plates (16,18).

3,891,465
BATTERY EQUIPPED WITH AN INDICATOR FOR THE LOWERING OF THE ELECTROLYTE LEVEL

Eiji Muto; Tsuneo Kawarabayashi; Koichi Matsumura, and Hitoshi Tamura, all of Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto-shi, Japan

Filed Aug. 16, 1973, Ser. No. 389,037
Int. Cl. H01m *31/04*
U.S. Cl. 136—182 **3 Claims**

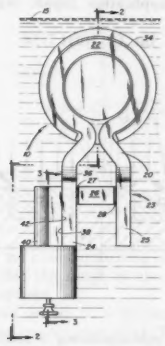


1. In a vent plug of a battery having an electrolyte level-detecting electrode, the improvement wherein the plug comprises: an upper hollow cap portion and a lower, vertically extending fume-protecting tube which extends into the electrolyte-containing portion of the battery, said tube containing a slot for passing gas generated within the battery through the interior of said tube to a gas vent in said cap; and an electrolyte level-sensing electrode supported in said hollow cap portion for rotation relative thereto and extending interiorly through and beyond the lower end of said tube, whereby the lower end of said electrode is in contact with the battery electrolyte when the electrolyte is at an acceptable level; so that said electrode remains stationary when the vent plug is rotated for removing it from, or inserting it in, an electrolyte filling hole of the battery.

3,891,466
ATTACHMENT DEVICE

Porter W. Erickson, and Alvin G. Hellfritzsch, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 2, 1968, Ser. No. 742,975
Int. Cl. H01h *47/26*
U.S. Cl. 136—200 **10 Claims**

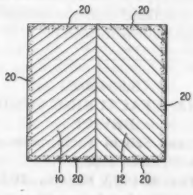


1. A magnetic device attachable to a ferromagnetic surface comprising:
a core;
coil means for said core;
thermocouple means energizing said core
said thermocouple means having a "hot" junction and a "cold" junction;
chemical charge means for producing heat energy and coupled to said "hot" junction;
said chemical charge means being selectively activated to produce sufficient heat at said "hot" junction to cause current to flow through said coil means and magnetize said core.

3,891,467
THERMOCOUPLE WITH A DIFFUSED CHROMIUM CASING

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 29, 1973, Ser. No. 364,588
Int. Cl. H01v *1/04*
U.S. Cl. 136—233 **8 Claims**



1. A thermocouple adapted for sensing a flame comprising an electropositive element,
an electronegative element joined to the electropositive element to form a thermocouple junction,
at least one of the elements containing a metal which causes formation of carbon desposits on the one element when exposed to burning fuel, and

a casing of chromium diffused in the exposed surfaces of the joined elements,

said casing decreasing in chromium content from essentially pure chromium at the surface of the elements to a substantially less chromium content within the elements.

3,891,468

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

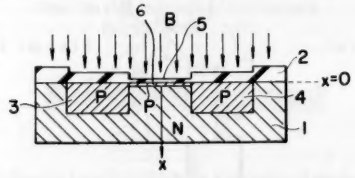
Katsuhiko Ito, Kokubunji and Takashi Tsuchimoto, Kodaira, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 20, 1973, Ser. No. 399,115

Claims priority, application Japan, Sept. 20, 1972, 47-93600

Int. Cl. H01l *7/54*

U.S. Cl. 148—1.5 **10 Claims**



2. A method of manufacturing a semiconductor device, comprising the steps of:

a. selectively introducing an impurity of a first conductivity type into a semiconductor substrate through a surface portion thereof, said substrate having a second conductivity type opposite said first conductivity type, so that the concentration gradient of said impurity of said first conductivity type in said substrate is at a prescribed maximum value substantially at the surface of said substrate and decreases therefrom into said substrate; and

b. selectively introducing an impurity of said second conductivity type into said substrate through said surface portion thereof, so that the concentration gradient of said impurity of the second conductivity type in said substrate increases from a first prescribed level at the surface of said substrate, reaches a prescribed maximum value at an established distance from said surface and decreases therefrom into said substrate, said prescribed maximum value of the concentration gradient of said second conductivity type impurity being relatively smaller than the prescribed maximum value of the concentration gradient of the impurity of said first conductivity type;

whereby a resultant impurity concentration distribution from the combined effects of steps (a) and (b) is formed in said substrate, said resultant distribution having said first conductivity type at the surface of said substrate and decreasing to a defined distance within said substrate at which a P-N junction is formed.

3,891,469

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Hideki Moriyama, and Seiichi Tachi, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 4, 1973, Ser. No. 403,661

Claims priority, application Japan, Oct. 4, 1972, 47-99008

Int. Cl. H01l *7/54*

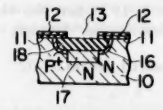
U.S. Cl. 148—1.5 **13 Claims**

1. A method of manufacturing a semiconductor device, comprising:

a. forming an oxidation-resisting film on a silicon substrate of a first conductivity type in conformity with a predetermined pattern;

b. diffusing an impurity of a second conductivity type opposite to that of said silicon substrate through an opening in said oxidation-resisting film, to form a first region;

c. implanting impurity ions of said first conductivity type through said opening to form a second region having a



depth deeper than and a width narrower than said first region; and

d. oxidizing the resultant silicon substrate by employing said oxidation-resisting film as a mask, to form a silicon dioxide region in said silicon substrate in the vicinity of said opening.

3,891,470

FERROUS METALS TREATED WITH IMIDAZOLE COMPOUNDS FOR CORROSION RESISTANCE

Akira Kotone, Nara; Masahiro Hoda, and Takeshi Hori, both of Sakai, all of Japan, assignors to Sakai Chemical Industry Company, Ltd., Osaka, Japan

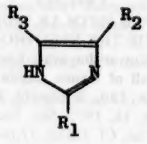
Filed Jan. 23, 1973, Ser. No. 326,002

Claims priority, application Japan, July 29, 1971, 46-56898

Int. Cl. C23c *13/02;* **C23f** *11/14*

U.S. Cl. 148—6.14 **5 Claims**

1. A ferrous metal treated for resistance to corrosion, said resistance to corrosion resulting from the application to said ferrous metal of a volatile corrosion inhibiting composition containing an imidazole compound of the formula



wherein each of R_1, R_2 and R_3 is independently hydrogen, methyl, ethyl, propyl or isopropyl.

3,891,471

METHOD OF MAKING PROTECTED GALVANIZED STEEL SHEETING

John E. Summers, Pittsburgh, Pa., and Gerhard Rose, Neukirchen, Germany, assignors to Robertson Bauelemente G.m.b.H., Germany

Continuation-in-part of Ser. No. 402,710, Oct. 2, 1973, abandoned, which is a continuation of Ser. No. 249,414, May 1, 1972, abandoned. This application June 7, 1974, Ser. No. 477,203

Int. Cl. C23f *7/26*

U.S. Cl. 148—6.16 **5 Claims**

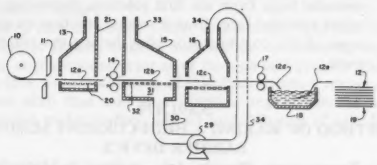
1. The method of making a protected metal sheet having a post-formable, oxidative-polymerizable polyester resin outer coat, comprising:

a. preheating a sheet of galvanized steel to a temperature of 60° to 100°C;

b. applying a film of wash primer dispersion in volatile solvent to at least one surface of the preheated sheet;

c. concurrently (*i*) volatilizing the solvent of the wash primer dispersion film; (*ii*) curing the wash primer film; and (*iii*) reheating the sheet to a temperature of 60° to 105°C;

d. applying, at a temperature of 180° to 220°C, a weather-resistant, hot-melt, oxidative-polymerizable polyester resin coating having a softening temperature of 105° to 120°C, ball-and-ring, to at least one wash primer-coated



surface of the said sheet which is at a temperature of 60° to 105°C;

e. cooling the hot-melt, resin-coated sheet to set the hot-melt resin coating at least 50°C below the softening temperature of the resin coating.

3,891,472

RELIEF-PATTERNED METAL ARTICLE AND A METHOD OF MAKING SAME

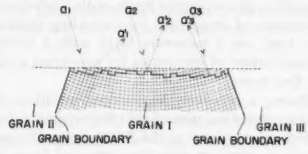
Kiyota Yoshida, and Mizuo Ejima, both of Tokyo, Japan, assignors to Rikagaku Kenkyusho, Wako-shi, Japan

Filed May 29, 1973, Ser. No. 364,406

Claims priority, application Japan, May 29, 1973, 48-53218

Int. Cl. C22f *1/00, 1/04*

U.S. Cl. 148—11.5 R **9 Claims**



1. A relief-patterned metal article comprising a crystal pattern composed of a plurality of crystal grains, at least some of which are large-sized crystal grains visible to the naked eye, at least selected of the large-sized crystal grains having a curved crystal lattice which is curved with respect to an outer surface of the article, said surface being etched and the curvature of the crystal lattice being sufficient for providing a visible relief pattern in the surface appearance of the article.

3,891,473

HEAT TREATING ATMOSPHERES

Henry F. Latva, Dearborn, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 17, 1973, Ser. No. 361,082

Int. Cl. C21d *1/74*

U.S. Cl. 148—16.7 **5 Claims**

1. A method of controlling the carbon content of a steel alloy containing about 0.18% to 0.85% by weight carbon, comprising:

providing ammonia and methane in a volume ratio ranging from about 60/40 for the lower C contents to 20/80 for the higher C contents while maintaining the ammonia and methane separate from each other,

dissociating the ammonia and combusting the methane while maintaining the separation,

mixing the constituents resulting from the dissociation and combustion of the ammonia and methane together,

introducing the mixed constituents into a heat treating environment, and

heat treating the alloy in the heat treatment environment in the presence of the mixed constituents.

3,891,474

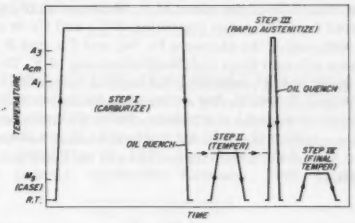
METHOD FOR THE CASE CARBURIZING OF STEEL

Raymond A. Grange, Washington Twp., Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 214,956, Jan. 3, 1972, abandoned. This application Nov. 9, 1973, Ser. No. 414,545

Int. Cl. C23c *11/12;* **C21d** *1/20*

U.S. Cl. 148—16.5 **10 Claims**



1. A method for the case carburizing of a steel article with carbon content within the range of about 0.1 to about 0.3 percent, which comprises,

a. carburizing said article at a temperature in excess of 1800°F but not greater than 2000°F in contact with a carbon containing substance for a time sufficient to diffuse carbon into said article to a desired case depth, said carburization producing a maximum carbon content greater than 0.9 percent to about 1.2 percent in the outer portion of the resultant carburized case,

b. quenching said article to a temperature below the M_s of the case, said case still having a maximum carbon content greater than 0.9 percent,

c. reheating the article to a temperature within the bainite region for a time sufficient to transform substantially all the austenite which is retained after said quench,

d. thereafter, reaustenitizing the lower carbon core of said article by rapidly heating to a temperature within the range A_3 to A_3=100°F of said core, and

e. maintaining the article within said A_3 temperature range only for a time sufficient to substantially equalize the temperature throughout the cross-section of the article, and

f. immediately thereafter, cooling the article to produce a martensitic case.

3,891,475

POLE PIECE FOR PRODUCING A UNIFORM MAGNETIC FIELD

Sadami Tomita, Katsuta; Akio Chiba, Hitachi, and Goh Miyajima, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 25, 1973, Ser. No. 354,467

Claims priority, application Japan, Apr. 26, 1972, 47-41328

Int. Cl. C04b *35/00*

U.S. Cl. 148—31.55 **6 Claims**

1. A pole piece for use in a magnetic circuit which comprises a soft magnetic alloy having a saturation magnetic flux density of at least 20,000 gauss when an external magnetic field of 100 oersted is applied and consisting essentially of 35 to 55 percent by weight of cobalt, 0.15 to 0.5 percent by weight of carbon, not more than 1 percent by weight of manganese, not more than 3 percent by weight of at least one of vanadium, titanium, chromium and niobium, not more than 0.2 percent by weight of silicon, not more than 0.2 percent by weight of aluminum, not more than 0.03 percent by weight of sulfur, not more than 0.03 percent by weight of phosphorus and the balance being substantially iron.

3,891,476

METHOD OF MAGNETIZING A BODY OF M_5R AT HIGH TEMPERATURES

Pieter Aart Naastepad, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 21, 1973, Ser. No. 418,124

Claims priority, application Netherlands, Dec. 15, 1972, 7217051

Int. Cl. H01f 1/02

U.S. Cl. 148—103 5 Claims

1. A method of magnetizing a body consisting principally of a material of the composition M_5R, M consisting of an element selected from the group consisting of Co and Co in combination with one of the elements Fe, Ni, and Cu, and R being an element selected from the group consisting of Y, Th, and the rare earth metals comprising the steps of, subjecting said body to a magnetic field having a strength sufficient to magnetically saturate the material and less than twice the intrinsic coercive field strength of the material at a temperature between 200°C and 0.5 times the Kelvin temperature of the Curie point of said material.

3,891,477

MATERIAL TREATMENT BY CRYOGENIC COOLING

James W. Lance, and Henry M. Jones, both of Stonewall, La., assignors to The Mangrove Enterprise, Incorporated, Wilmington, Del.

Filed Sept. 9, 1971, Ser. No. 179,218

Int. Cl. C22c 41/04

U.S. Cl. 148—125 8 Claims

1. A method of treatment of materials consisting of metals by cryogenic cooling for improvement of the microstructure of such material comprising the steps of: reducing the temperature of said material to about −320°F. by supporting said material above a body of liquid nitrogen in a container and lowering said material toward said nitrogen at a rate less than the rate at which thermal fracturing of said material occurs, immersing said material into said liquid nitrogen for a predetermined period of time within the range of about 18 hours to about 30 hours; separating said material and said liquid nitrogen; and permitting said material to return to room temperature, wherein the step of reducing the temperature of said material is effected at temperature and time rates of reduction varying from a minimum range of about 2.8°–4°F per minute to a maximum range of about 10.7°–15°F per minute in accordance with the mass and nature of said material and is effected in at least two stages above and below a predetermined thermal fracture threshold for said material.

3,891,478

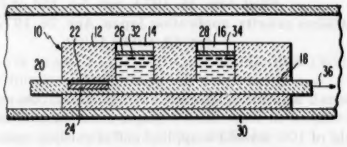
DEPOSITION OF EPITAXIAL LAYER FROM THE LIQUID PHASE

Ivan Ladany, Stockton, and Vincent Michael Cannuli, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 16, 1973, Ser. No. 388,960

Int. Cl. H01l 7/38

U.S. Cl. 148—171 5 Claims



1. A method of depositing on a substrate an epitaxial layer of a single crystalline compound or alloy having a volatile element comprising the steps of

depositing on a surface of said substrate from a first solution an epitaxial layer of the same material as that of the substrate by bringing the surface of the substrate into contact with the first solution, increasing the temperature of the first solution to melt some of the material of the substrate at said surface into the first solution, then cooling the first solution, and

immediately upon removing the substrate and the initial epitaxial layer from the first solution, depositing on the initial epitaxial layer from a second solution an epitaxial layer of the compound or alloy having the volatile element.

3,891,479

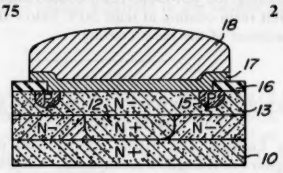
METHOD OF MAKING A HIGH CURRENT SCHOTTKY BARRIER DEVICE

Ross Zwernemann, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 190,494, Oct. 19, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,642

Int. Cl. H01l 3/00, 5/00, 29/48

U.S. Cl. 148—175 2 Claims



1. A method of constructing improved high current Schottky barrier devices including the steps of:

a. growing a first epitaxial layer, with a relatively light concentration of impurities for providing conductivity of a first type, on a substrate layer with a relatively heavy concentration of impurities for providing conductivity of the first type;

b. diffusing a relatively heavy concentration of impurities into a central portion of said first epitaxial layer for providing conductivity of the first type, said central portion extending through said first epitaxial layer into contact with said substrate layer;

c. growing a second epitaxial layer, with a relatively light concentration of impurities for providing conductivity of a first type, on said first epitaxial layer;

d. diffusing a guardring of impurities, for providing conductivity of a second type, into said second epitaxial layer in a relatively light concentration and substantially equally spaced about said central portion of said first epitaxial layer;

e. depositing a layer of insulating material on the surface of said second epitaxial layer and forming an aperture therethrough having an outer periphery located generally above and coextensive with said guardring, and exposing a portion of the surface of the second epitaxial layer; and

f. depositing barrier and contact metals on the exposed portion of the surface of the second epitaxial layer to form a Schottky barrier.

3,891,480

BIPOLAR SEMICONDUCTOR DEVICE CONSTRUCTION

David E. Fulkerson, Minnetonka, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 1, 1973, Ser. No. 402,550

Int. Cl. H01l 7/44

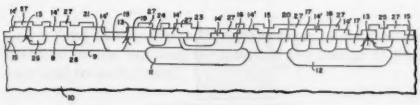
U.S. Cl. 148—187 9 Claims

1. A method for providing a semiconductor device, said method comprising:

providing a semiconductor layer on a substrate, said semiconductor layer being of a first conductivity type having a first conductivity and further having an exterior major surface opposite an interior major surface thereof, said substrate with said semiconductor layer thereon having a

first blocking region, of said first conductivity type with a second conductivity, located at least in part in said semiconductor layer and without said substrate with said semiconductor layer thereon having a region of a second conductivity type provided therein prior to said providing of said semiconductor layer for aiding in providing a first isolation region;

diffusing simultaneously a first active region and said first isolation region, both of said second conductivity type, into said semiconductor layer through said exterior major surface so said diffusing of said first isolation region occurs such that said first isolation region reaches said interior major surface and so said diffusing of said first



active region occurs such that said first active region encounters said first blocking region before reaching said interior major surface, said first active region being enclosed by said first isolation region in said exterior major surface; and

diffusing a second active region of said first conductivity type into said first active region through said exterior major surface, such that said second active region is sufficiently close to said first blocking region and such that said first active region has a diffusant concentration of such a value that a bipolar transistor having a substantial current gain results with said first active region serving as a base and said second active region serving as an emitter.

3,891,481

METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

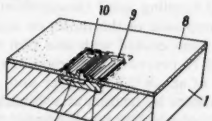
Reinhold Kaiser, Heilbronn, Germany, assignor to Telefunken Patentverwertungsgesellschaft mbH, Ulm, Danube, Germany

Filed Dec. 1, 1969, Ser. No. 881,147

Claims priority, application Germany, Dec. 2, 1968, 1812059

Int. Cl. H01 *7/44*

U.S. Cl. 148—188 **4 Claims**



1. A method of producing a semiconductor device comprising covering a limited area of a semiconductor body with a layer containing diffusion impurities, and then diffusing said impurities into said semiconductor body in two stages, firstly diffusing only into the surface region of said semiconductor body in a prediffusion in an oxidising atmosphere to a depth short of the prescribed depth, secondly diffusing into said semiconductor body down to the prescribed depth in a subsequent diffusion likewise effected in an oxidising atmosphere and removing between said first and second stages said layer containing said impurities and an oxide layer formed during the prediffusion.

3,891,482

PROPELLANT INSTABILITY MODIFIER

Robert S. Brown, Santa Clara, and Raymond J. Muzzy, Saratoga, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 32,432, April 27, 1970, abandoned. This application July 18, 1974, Ser. No. 489,871

Int. Cl.[2] C06B *45/34*

U.S. Cl. 149—7 **8 Claims**

1. In a propellant composition comprising an oxidizer and an organic binder component, the improvement wherein the oxidizer particle has been coated with ethylcellulose.

3,891,483

METHOD FOR ETCHING SEMICONDUCTOR SURFACES

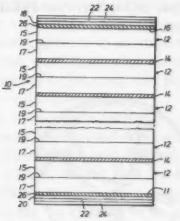
Jurgen Messerschmidt, Letmathe, and Rigobert Schimmer, Belecke, both of Germany, assignors to Licentia-Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

Filed May 30, 1974, Ser. No. 474,865

Claims priority, application Germany, June 1, 1973, 2327878

Int. Cl. H01l *7/50*

U.S. Cl. 156—3 **22 Claims**



1. A method for etching semiconductor surfaces of a semiconductor body comprising:

a. soldering coated electrodes to the semiconductor body, said coated electrodes each comprising an electrode to which a nickel layer and then a layer of silver has been applied, to provide exposed semiconductor surfaces and protected semi-conductor surfaces covered by said coated electrodes,

b. contacting the semiconductor body with an etchant to etch the exposed semiconductor surfaces,

c. rinsing the etched semiconductor body surfaces with deionized water, and

d. treating the rinsed body with an ammoniacal hydrogen peroxide solution.

3,891,484

EQUIPMENT FOR MANUFACTURING STRATIFIED ISOTHERMAL PANELS

Paul Lamberet, Vonnas-Ain, France

Continuation-in-part of Ser. No. 248,538, April 28, 1972, Pat. No. 3,834,968. This application Sept. 6, 1973, Ser. No. 394,717

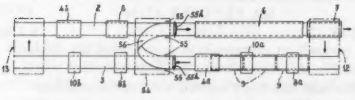
Claims priority, application France, May 9, 1973, 73.17424

Int. Cl. B32b *31/04*

U.S. Cl. 156—60 **7 Claims**

1. Apparatus for manufacturing isothermal panels of stratified matrial, which comprises a pair of parallel adjacent tracks including an outward track and a return track, platforms adapted to travel along said tracks, transfer means at the ends of said tracks for transferring said platforms from one track to the other track, a tubular oven adjacent one end of said outward track, and a plurality of treatment stations disposed along said tracks, one of said stations being located upstream of said oven and being adapted for laying expanded material

on said platforms, another of the stations being disposed on said return track and being adapted to distribute successively and continuously to each platform on the return track a resin mixture and a textile reinforcement for constituting a stratified sheet of an isothermal panel, and means for continuously



transferring said panel from said return track to the outward track by overturning said panel by guiding the same through a helical path, to bring said panel to a location disposed between the station where the expanded material is laid down and the tubular oven with the panel being superposed on the expanded material.

3,891,485

METHOD OF EMBOSSING WITH MANUALLY ADJUSTABLE PATTERNS OR DESIGNS

Din-Min Lin, 2-1, Alley 15 Ln. 68, Section 2 Hsin Sheng North Rd., Taipei, China /Taiwan

Filed July 24, 1974, Ser. No. 491,458
Int. Cl. B44c *5/00*
U.S. Cl. 156—63 **1 Claim**

1. A method of producing an embossing plate comprising the steps of:

a. providing a background plate having a layer of fiber mounted on the front surface thereof and then punching the plate to form a desired punched pattern;

b. passing a piece of cloth or fiber from the rear side of the plate through the punched holes and then protruding the same out of the fibered front surface of the plate to form thereon a raised pattern;

c. adjusting or modifying the protruding cloth or fiber at one's will so as to obtain a creative and vivid pattern;

d. gluing the cloth or fiber to the periphery walls of the punched holes on the background plate and then spraying the raised surface thereof with a liquid resin oil to thereby obtain a stiff raised pattern; and

e. sandwiching the cloth or fiber with another plate by gluing the latter to the rear surface of the background plate.

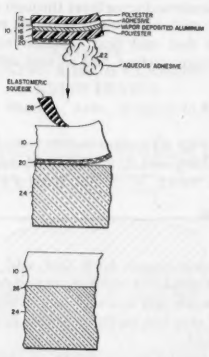
3,891,486

PROCESS FOR PRODUCING SOLAR CONTROL WINDOW

Michael E. Willdorf, Malden, Mass., assignor to Material Distributors Corporation, Woburn, Mass.

Division of Ser. No. 113,426, Feb. 8, 1971, Pat. No. 3,775,226. This application Sept. 4, 1973, Ser. No. 393,806
Int. Cl. B32b *17/06*
U.S. Cl. 156—71 **5 Claims**

1. A process for producing a solar control window, said process comprising the steps of superposing a semi-transparent solar control film upon a window surface with an aqueous detergent interposed therebetween, said solar control surface comprising in laminated sequence, an optically clear silicone release stratum, an optically clear polyester support stratum, an optically clear polyester bonding stratum, a semi-transparent vapor deposited aluminum stratum, an optically clear polyester support stratum, and an optically clear pressure sensitive stratum being in contiguity with said window surface,



said release stratum being remote from said window surface, squeegeeing said solar control film into intimate contact with said window surface while said pressure sensitive adhesive stratum is deactivated by said aqueous detergent, and permeating said aqueous detergent out of the interface between said pressure sensitive stratum said window surface in order to reactivate said pressure sensitive adhesive stratum.

3,891,487

DECOR TIVE LAMINATE

Charles E. Hoey, Marlton, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 19, 1973, Ser. No. 426,298
Int. Cl. B32b *5/18*
U.S. Cl. 156—78 **13 Claims**

1. A process for making a decorative laminate which comprises:

a. applying a foamed crosslinkable acrylic polymer having a Tg of −60° to 30°c. in a thickness of 10 to 150 mils to a substrate;

b. drying the foam without causing thermosetting;

c. placing a self-bonding solid (transparent) plastic film which is thermoplastic or thermoset on said foam;

d. crushing the foam coated with said film to a thickness between 5 and 25 percent of its original dry thickness to give a density of about 0.2 to 3 g./cc and

e. curing the laminate by heating at a suitable temperature whereupon the plastic film is self-bonded to the crushed foam.

3,891,488

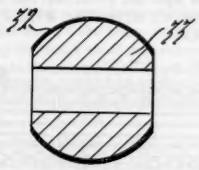
STRUCTURAL BEARING ELEMENT HAVING A LOW FRICTION SURFACE AND METHOD

Charles S. White, 35815-42nd St. East, Palmdale, Calif. 93550

Continuation-in-part of Ser. No. 76,110, Sept. 28, 1970, abandoned. This application Dec. 20, 1972, Ser. No. 316,844
Int. Cl. B65h *81/00;* **B21d** *53/10*
U.S. Cl. 156—170 **16 Claims**

1. The method of producing a low friction bearing surface on a structural bearing element, characterized by the steps of helically winding a multiplicity of juxtaposed turns of a continuous strand of bondable low friction thread impregnated with a bonding resin in a solidified yet thermoplastic state onto a

surface of the element, said thread element being comprised of bondable filaments and low friction filaments, and treating



such wound element to coalesce the resin into a continuous solidified matrix bonding the turns of the thread to the element and to each other.

3,891,489

PRESSURE CURE METHOD OF MAKING RESIN PIPE

Dalton W. Bordner, Fullerton, and Harlan H. Kline, Diamond Bar, both of Calif., assignors to Ameron, Inc., Brea, Calif.

Filed Nov. 24, 1969, Ser. No. 879,337
Int. Cl. B65h *81/00*
U.S. Cl. 156—171 **15 Claims**

1. The improvement in the manufacture of resin pipe, comprising:

winding an uncured resin impregnated pipe on a mandrel, rapidly heating said pipe to a temperature in the range of from 200°F to 400°F from the interior of said mandrel to cure said resin, said heating being sufficiently rapid so that the heat-up profiles at different radii within said pipe are substantially uniform,

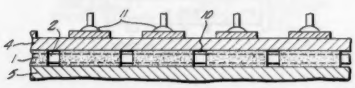
subjecting the unenveloped pipe, during said heating, to pneumatic pressure provided by exposing said pipe exterior directly to gas under pressure of at least 35 psig, and rotating said pipe and mandrel during said heating to prevent uncured resin from draining from said pipe.

3,891,490

WELDED POLYMERIC ARTICLES AND PROCESS

William H. Humphries, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed June 6, 1974, Ser. No. 476,895
Int. Cl. B29c *19/00;* **B29d** *23/10;* **B32b** *31/00*
U.S. Cl. 156—295 **9 Claims**



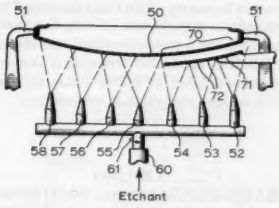
1. A method of integrally joining abutting surfaces of cross-linked polymeric articles which comprises disposing between said surfaces a plurality of spaced inserts consisting essentially of thermoplastic polymeric composition containing an effective cross-linking amount of a heat activated cross-linking agent, and heating said surfaces and inserts under compression for a time and at a temperature sufficient to cause said inserts to flow and wet said surfaces and to activate said cross-linking agent, effecting formation of covalent cross-links between each of said surfaces and the polymeric constituent of said inserts, the modulus of the resulting cross-linked butt weld being at least equal to that of said articles.

3,891,491

APPARATUS FOR RE-ETCHING A COLOR CATHODE RAY TUBE SHADOW MASK

Martin L. Lerner, River Forest, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 243,945, April 14, 1972, Pat. No. 3,808,071. This application Jan. 24, 1974, Ser. No. 436,243
Int. Cl. C23f *1/02*
U.S. Cl. 156—345 **4 Claims**



1. Apparatus for re-etching the apertures of a color cathode-ray tube shadow mask of the type which comprises a convex-concave configuration, a multiplicity of apertures arranged in a predetermined pattern and having an initial predetermined size relationship from aperture-to-aperture, a predetermined first set of said apertures being susceptible of enlargement at a faster rate than a predetermined second set of apertures upon exposure to an etchant capable of attacking said shadow mask, said apparatus comprising:

support means for supporting said shadow mask in air with the convex side down; and

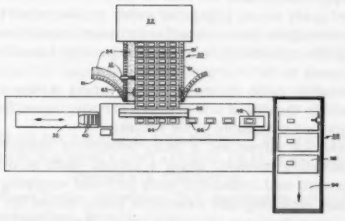
spray means including a plurality of spray nozzles positioned beneath said mask for projecting vertically upward a varying quantity of said etchant to said second set of apertures relative to said first set of apertures such as to at least partially compensate for the greater susceptibility to enlargement by etching of said first set of apertures than said second set of apertures and promote equalization of enlargement of both sets of apertures.

3,891,492

ARTICLE LABELING APPARATUS AND LABEL FORM THEREFOR

Donald W. Watson, Arlington Heights, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed July 17, 1973, Ser. No. 379,977
Int. Cl. B32b *31/00*
U.S. Cl. 156—351 **10 Claims**



1. In combination with automatic article labeling apparatus wherein individual labels are derived from an array of printed labels and transferred to corresponding articles transported to a label applying station, the improvement comprising:

an array of printed labels including a label field and a label identifying field, said label field comprising a plurality of rows and at least one column of printed labels, and said label identifying field comprising indicia associated with corresponding rows of labels, the indicia associated with

a row serving to identify the information borne by at least one label in said associated row;

means for advancing said array of printed labels to said label applying station;

means for scanning said label identifying field as said array of printed labels is advanced to said label applying station to generate representations of said indicia;

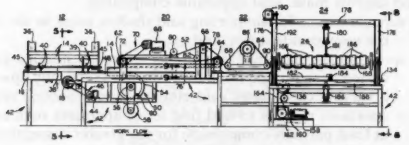
means coupled to said scanning means and responsive to said generated representations for determining if the information borne by a label and identified by said indicia corresponds to preselected information; and

means for initiating a predetermined operation of said automatic labeling apparatus when it is determined that a predetermined label in a row bears information corresponding to said preselected information.

3,891,493
APPARATUS FOR SLITTING POSITIONING AND WRAPPING TUBULAR OBJECTS

Rupert Douglas Terry, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 137,356, April 26, 1971, Pat. No. 3,755,039. This application Jan. 22, 1973, Ser. No. 325,698
Int. Cl. B31c *5/00;* **B65h** *81/00*
U.S. Cl. 156—455 **4 Claims**



1. Apparatus for jacketing cylindrical bodies comprising:

means for advancing a cylindrical body along a first path to wrapping station, said first path being parallel to the longitudinal axis of said cylindrical body;

means for slitting at least one wall of said cylindrical body parallel to the longitudinal axis of said cylindrical body as it is advancing along the first path so as to produce a longitudinal slot;

fixed guide means engagable within the slot of said cylindrical body to maintain a fixed circumferential orientation of the cylindrical body as it is passing from the slitting means to the wrapping station;

extensible guide means at said wrapping station engagable within the slot of said cylindrical body; means for retracting said extensible guide means;

means for advancing a tacky adhesively coated sheet of jacketing material along a second path in a direction toward said cylindrical body and said wrapping station;

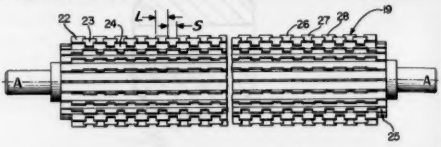
means including said extensible guide means for effecting contact between an edge portion of said sheet of jacketing material and the outer peripheral surface of the cylindrical body so that said edge portion is adjacent and in parallel alignment with the longitudinal slot of the cylindrical body,; and

means for rotating the cylindrical body about its longitudinal axis in a direction substantially normal to the direction of advancement of the cylindrical body to effectively apply the sheet of jacketing material to the outer peripheral surface of the cylindrical body said rotating means being activated after said extensible guide means is retracted.

3,891,494
PRICKER ROLL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 26, 1973, Ser. No. 354,575
Int. Cl. B29h *9/04;* **B32b** *25/02*
U.S. Cl. 156—437 **20 Claims**

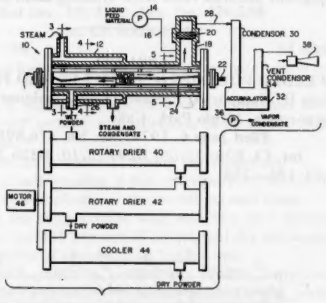


1. A calender for embedding reinforcement cords in rubber material, comprising at least one rotatable roll for pricking configured openings in the rubber material prior to the contact of the material with the cords, the roll including a plurality of rows of spaced teeth extending from the roll for piercing the rubber material, the rows of teeth being spaced around the roll and extending longitudinally thereof, each tooth being designed to cut, in the rubber material, an elongated slot having its longitudinal axis angularly disposed to the longitudinal axis of the cord-reinforced material being formed, the teeth of adjacent rows being staggered longitudinally of the roll so as not to be in crosswise alignment, and the teeth of alternate rows at least spanning the spacing(s) between the teeth of rows therebetween.

3,891,495
METHOD AND APPARATUS FOR RECOVERING POWDERS FROM LIQUIDS

James L. Baird, Winchester, Mass., assignor to Artisan Industries Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 255,536, May 22, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,163
Int. Cl. B01d *3/08, 3/00, 1/22*
U.S. Cl. 159—6 WH **17 Claims**



1. A thin-film evaporator, which evaporator comprises in combination:

a. a closed substantially horizontally axised steam-jacketed chamber characterized by an interior wall defining a surface of revolution;

b. a rotor shaft centrally positioned within the chamber;

c. means to rotate the rotor shaft;

d. a feed inlet at the one end of the chamber for the introduction of a liquid feed material into the chamber;

e. a product outlet at the other end of the chamber for the withdrawal of a slurry or powder material from the chamber;

f. a vapor outlet at the one end of the chamber for the removal of the vapor from the chamber; and

g. a plurality of rotor blades secured to the rotor shaft and adapted for rotation therewith, the blades having a one end and another end and coaxially arranged along the rotor shaft and extending into a close, thin-film-forming relationship with the interior wall of the closed chamber, the blades comprising a series of straight-edged sections skewed from the axis of the rotor shaft from one to the other end along the rotor shaft and comprising

i. first straight-bladed section pitched opposite to the direction of rotation of the rotor blades at a skew angle of about 1° to 15° with the axis of the rotor shaft, and extending from the region of the one end toward the product outlet, the first straight-bladed section adapted to impart a vector component to the liquid feed material introduced into the closed chamber toward the product outlet;

ii. a second straight-bladed section aligned and coplanar with the axis of the rotor shaft;

iii. a third straight-bladed section pitched at an angle opposite to the direction of rotation and at a skew angle from about 1° to 15° with the axis of the rotor shaft, and extending from just upstream of the product outlet to across and just downstream of the product outlet and adapted to impart a vector component to the material in the closed chamber toward the product outlet; and

iv. a fourth straight-bladed section pitched in the direction of rotation and opposite to the pitch of the third-bladed section, and having a skew angle from about 1° to 15° with the axis of the rotor shaft, and extending from the end of the third section to the end of the rotor at the other end, and adapted to impart a vector component to the material toward the product outlet.

3,891,496

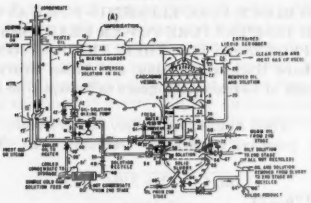
METHOD OF HEAT EXCHANGE AND EVAPORATION

Ransome W. Erwin, Ogden, Utah, assignor to Austral-Erwin Engineering Co.

Filed Nov. 14, 1972, Ser. No. 306,183

Int. Cl. B01b ; B01d *3/34, 19/00, 1/00, 3/00, 1/22;* **F28f** *13/18*

U.S. Cl. 159—47 R **5 Claims**



1. The improvement in the method of evaporating an aqueous solution containing dissolved solids to prevent adherence of precipitated solids to the contacting surface of the apparatus in which the method is carried out; which improvement consists in that the evaporation of the solution takes place in apparatus whose hot contacting surface is preferentially oil wettable and substantially zero adsorbent of water from the solution while continuously wetting the contacting surface with an organic liquid which is immiscible with the aqueous solution being evaporated, said contacting surface comprising a fluorocarbon polymer.

3,891,497

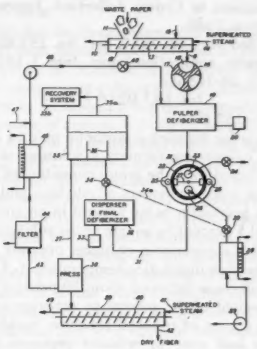
NON-AQUEOUS DEFIBERIZING PROCESS OF WASTE PAPER IN THE PRESENCE OF STEAM AND A LIQUID NONMISCIBLE IN WATER, E.G., TETRACHLORETHYLENE

Robert A. Daane, Rockton, and Shu Tang Han, South Beloit, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 22, 1973, Ser. No. 343,841

Int. Cl. D21b *1/08;* **D21c** *5/02*

U.S. Cl. 162—6 **15 Claims**



1. A mechanism for the recovery of high quality dry pulp from waste paper comprising in combination:

first means adding a predetermined amount of aqueous moisture to said waste;

a defiberizer connected to said means receiving and defibering said waste;

means to pressurize the defiberizer;

second means connected to said defiberizer adding a liquid nonmiscible in water to said waste so that defibering forces in said defiberizer will be transmitted to the fibers in the waste through said liquid and through the aqueous moisture in the fibers;

an open demoisturizer chamber for operating at substantially atmospheric pressure connected to receive the waste from said second means for removing the aqueous moisture from the fibers to a predetermined dryness;

pressure release means between said defiberizer and said demoisturizer chamber so that the chamber will operate at said atmospheric pressure;

and a mechanical press connected to receive the waste from said chamber for substantially completely removing said nonmiscible liquid from the fibers.

3,891,498

METHOD OF INCREASING THE PRODUCTION RATE OF ASBESTOS FIBER CONTAINING ARTICLES AND PRODUCT THEREOF

Thomas Harry Sadler, Middlesex, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 206,211, Dec. 8, 1971, abandoned, which is a continuation of Ser. No. 699,285, Jan. 2, 1968, abandoned. This application July 19, 1974, Ser. No. 490,638The portion of the term of this patent subsequent to Feb. 6, 1990, has been disclaimed.

Int. Cl. D21h *5/18;* **D21f** *11/00*

U.S. Cl. 162—154 **13 Claims**

1. In the method of producing an asbestos-cement article from a slurry containing particulate material including asbestos fibers and hydraulic cement by depositing portions of said particulate material onto a surface to form a sheet of said

particulate material which sheet is then used to form said article, the improvement comprising increasing the production rate at which said articles are produced by including in said slurry a substantially non-foaming anionic sulfonated dispersant in an approximate amount of 0.01 to 0.5 percent by weight based upon the total dry weight of the solids of the slurry.

3,891,499
SYNTHETIC PAPERMAKING PULP AND PROCESS OF MANUFACTURE

Teiji Kato, Iwakuni, and Katsumi Okamoto, Kodaira, both of Japan, assignors to Crown Zellerbach International, Inc., San Francisco, Calif.

Filed May 30, 1972, Ser. No. 257,609

Claims priority, application Japan, June 3, 1971, 46-38260; Dec. 28, 1971, 46-105654

Int. Cl.[2] D21F *11/00*

U.S. Cl. 162—157 R **1 Claim**

1. A process for forming a synthetic pulp of discrete polyolefin fibers comprising forming a solution of a crystalline polyolefin selected from the group consisting of polyethylene, polypropylene and copolymers of ethylene and propylene in a solvent the polyolefin being present in an amount between about 0.5 and 5 percent by weight of the solution, the solution being formed at autogeneous or higher pressure at a temperature above the melt dissolution temperature and at a temperature which will cause between about 20 percent and about 70 percent by weight of the solvent to vaporize upon adiabatic flashing into a zone of reduced pressure, rapidly passing the solution into said zone of reduced pressure to vaporize a portion only of said solvent and precipitate a fibrous polyolefin gel containing less than about 7 percent by weight of the polyolefin, and passing the fibrous polyolefin gel through a disc refiner to liberate discrete polyolefin fibers.

3,891,500
PAPER MACHINE HAVING A LONG TRANSPORT WIRE FOR MAKING TISSUE PAPER

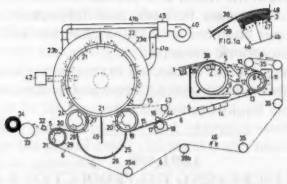
Matti Kankaanpää, Tapiola, Finland, assignor to Valmet O. Y., Helsinki, Finland

Filed Mar. 22, 1973, Ser. No. 343,781

Claims priority, application Finland, Mar. 29, 1972, 896/72

Int. Cl. D21f *9/00*

U.S. Cl. 162—274 **7 Claims**



1. Paper machine for manufacturing tissue paper from a web, comprising, in combination:

a. a headbox with an outlet slit for fluid stock from which a web is formed,

b. a forming section including a curved initial part and a forming wire receiving the web from said outlet slit,

c. a return roll producing a centrifugal force dewatering the web, said forming wire passing over said return roll,

d. a principal transport wire carried by a plurality of rolls and passing over said return roll, which deflects the web 120° to 180° while the web is interposed between said forming wire and said principal transport wire,

e. a transfer roll and a second transport and support wire passing over said transfer roll, the web being interposed between said principal transport wire and said second transport and support wire,

f. a perfusion-impingement drier assembly having a cylinder with a permeable mantle, said transfer roll conducting the web onto said cylinder, said principal transport wire being interposed between the web and said mantle, and

g. a pick-off roll and a reeling apparatus, said pick-off roll detaching the web from said cylinder and transmitting it to said reeling apparatus, said principal transport wire traveling back to said return roll.

3,891,501
MULTILAYER PAPER MAKING MACHINE

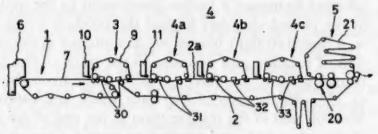
Teruhiko Oka, and Masamichi Fujii, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 23, 1973, Ser. No. 335,090

Claims priority, application Japan, Feb. 29, 1972, 47-24146

Int. Cl. D21f *9/00*

U.S. Cl. 162—290 **6 Claims**



1. Combination paper making machine which comprises a Fourdrinier wire comprising an endless foraminous belt defining a paper forming path, headbox means for supplying a first paper forming slurry to one end of said Fourdrinier wire, a looped conveying felt having one end adjacent the Fourdrinier wire and the other end away from said Fourdrinier wire, at least one inverform paper layer making endless wire means extending over and between said Fourdrinier wire and said looped conveying felt, and second headbox means adjacent to said Fourdrinier wire and before said inverform paper layer making means for supplying a second paper forming slurry on top of said first paper forming slurry on said Fourdrinier wire.

3,891,502
PRESSED BLOCK FUEL ELEMENTS FOR GAS COOLED HIGH TEMPERATURE POWER REACTORS AND PROCESSES FOR THEIR PRODUCTION

Karl-Gerhard Hackstein, Hanau, and Milan Hrovat, Rodenbach, both of Germany, assignors to Nukem G.m.b.H., Germany

Filed Aug. 1, 1972, Ser. No. 277,050

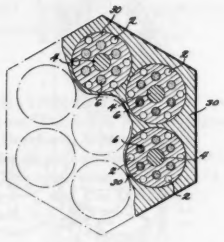
Claims priority, application Germany, Feb. 14, 1972, 2206843

Int. Cl. G21c *3/04, 3/22*

U.S. Cl. 176—71 **6 Claims**

1. A block fuel element for high temperature power reactors, said element being simple to reprocess and consisting essentially of (1) a fuel free zone consisting of a graphite matrix material, (2) cooling channels, (3) feed zones containing fissile uranium particles embedded in the same type of graphite matrix material, and (4) breed zones containing thorium particles embedded in the same type of graphite matrix material, whereby said cooling channels, said feed zones and said breed zones are all embedded within and surrounded by said fuel free graphite matrix material and together form the block fuel element, said feed zones and breed zones being disposed separately from one another in noncontiguous manner so that the feed zones and the breed zones can be separated independently from the surrounding graphite prior to reprocessing, whereby in the reprocessing operation uranium 233 bred from the thorium is provided from the breed particles and uranium 235 and fission products are

produced from the feed particles, there being a plurality of arrangements of feed zones, breed zones and cooling channels in repetitive sequence within the block fuel element, each of these arrangements consisting of a plurality of feed zones, said



feed zones contain uranium and are disposed around and separate from a central thorium containing breed zone, and a plurality of cooling channels are disposed outside and around said feed zones.

3,891,503

METHOD FOR CULTIVATING YEASTS

Tadao Matubayashi, Ichihara; Taiichi Shiono, Chiba; Yositugu Hukuda, Ichihara, and Toshio Kimura, Chiba, all of Japan, assignors to Dainippon Ink & Chemicals Inc. and Dai-Nippon Suban Manufacturing Co. Ltd., both of Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,221

Claims priority, application Japan, Feb. 26, 1973, 48-22125

Int. Cl. C12b *1/00*

U.S. Cl. 195—28 R 9 Claims

1. A method for cultivating yeasts comprising mix-cultivating hydrocarbon utilizable yeasts and hydrocarbon unutilizable yeasts under aerobic conditions in a medium containing hydrocarbons as a carbon source in a fermentor, recovering the yeast cells from the broth fed out of the fermentor and refreshing the residual broth with the nutrient consumed in the mix cultivation and then recycling the refreshed residual broth to the fermentor for mix cultivation.

3,891,504

PROCESS FOR THE MANUFACTURE OF ZEAXANTHIN

Arno Johannes Schocher, Benken, and Oswald Wiss, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 166,319, July 26, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,019

Claims priority, application Switzerland, July 31, 1970, 11592/70

Int. Cl. C12d *13/02*

U.S. Cl. 195—28 R 15 Claims

1. A process for the preparation of zeaxanthin containing cell-mass, comprising:

cultivating a microorganism selected from the group consisting of Flavobacter ATCC 21,081 and Flavobacter ATCC 21,588 in a nutrient media which contains a source of assimilable carbon and a source of assimilable nitrogen.

3,891,505

METHOD FOR PREPARATION OF A NEW ANTIFUNGAL ANTIBIOTIC

Danuta Maria Kotiuszko; Krystyna Maria Wituch; Danuta Janina Siejko; Halina Morawska; Natalia Porowska; Maria Teresa Horodecka; Maria Waclawa Wolkowicz; Marzena Nowacka; Zofia Eliza Makarowska-Plociennik, and Leszek Halski, all of Warsaw, Poland, assignors to Instytut Przemyslu Farmaceutycznego, Warsaw, Poland

Continuation of Ser. No. 69,672, Sept. 4, 1970, abandoned. This application Aug. 14, 1973, Ser. No. 388,091

Claims priority, application Poland, Sept. 11, 1969, 135793

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R 5 Claims

1. A method for the preparation of a polifungin antibiotic complex of at least three tetraenes obtained from the mycelium of a culture of Streptomyces noursei var. polifungin ATCC 21581 comprising cultivating said culture under aerobic conditions in an aqueous nutrient containing 1–10% by weight of a source of carbon, 0.1–5% by weight of a source of nitrogen and 0.1–3% by weight of a buffering agent at a temperature of 25°–35°C. under a pH of 6–7 for a period of 3 to 6 days, filtering off the mycelium so produced, washing said mycelium with water, extracting said mycelium with methanol at a temperature of 10°–50°C. three times, concentrating the cumulated extracts under a reduced pressure at a temperature not exceeding 50°C., filtering off the precipitate so formed and purifying the precipitate by elution of contaminants with solvents selected from the group consisting of ethylene chloride, ethyl acetate, 30% aqueous isopropanol with 1% sodium hexametaphosphate and 30% aqueous isopropanol at a temperature of 15°–60°C.

3,891,506

ANTIBIOTIC SUBSTANCE AND PROCESS FOR ITS PREPARATION

Katsura Munakata, Nagoya; Takeshi Oda, Tokyo; Toshito Mori, Tokyo, and Hisakatu Ito, Tokyo, all of Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

Division of Ser. No. 200,524, Nov. 19, 1971, which is a continuation-in-part of Ser. No. 737,333, June 17, 1968, abandoned. This application Mar. 25, 1974, Ser. No. 454,606

Claims priority, application Japan, June 21, 1967, 42-39296; June 15, 1968, 43-40863

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R 19 Claims

1. A process for preparation of antibiotic Quintomycin, which comprises culturing *Streptomyces lividus* or its mutant under aerobic conditions in a medium containing a carbon source and a nitrogen source, and recovering antibiotic Quintomycin from the culture broth.

3,891,507

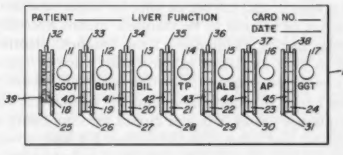
ORGAN FUNCTION TEST CARDS

Charles Benedict Breuer, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,749

Int. Cl. C12k *1/04*

U.S. Cl. 195—103.5 R 6 Claims



1. A diagnostic test card for the determination of organ function or status from the concentration of various biochemical and chemical constituents in blood, serum or plasma, which comprises a plurality of solid and dried diagnostic test

indicators mounted on said card, each of said test indicators comprising a bibulous carrier material impregnated with the dried residue of a chromogenic liquid reagent system capable of changing color in response to the concentration of said constituents in said blood, serum or plasma, when in contact therewith, each of said test indicators, in combination, indicative of the function or status of the same organ, and at least one corresponding color comparator control mounted on said card specific for each diagnostic test indicator thereon.

3,891,508
METHOD OF RAPID IDENTIFICATION OF GRAM-NEGATIVE BACTERIA

Joseph M. Merrick, 43 Exeter St., Williamsville, N.Y. 14221

Filed June 1, 1973, Ser. No. 366,303
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 **9 Claims**

1. A method of rapid identification of Gram-negative bacteria comprising:

culturing unknown bacteria on a nutrient medium:

harvesting by centrifugation;

sampling 0.1 mg as a minimum bacterial sample size;

extracting and isolating lipopoly saccharides (LPS) from the bacteria;

hydrolyzing of LPS into monosaccharide constituents; and determining the sugar composition of the polysaccharide fraction by gas-liquid chromatographic procedures and comparing the sugar composition of the unknown bacterial LPS with those of known bacteria for identification.

3,891,509
CO_2 GENERATING TABLET FOR CULTURE DEVICES

Don R. Warren, and Louis W. Busse, both of Madison, Wis., assignors to Clinical Convenience Products, Inc., Madison, Wis.

Filed May 6, 1974, Ser. No. 466,985
Int. Cl. C12b *1/00*
U.S. Cl. 195—109 **10 Claims**

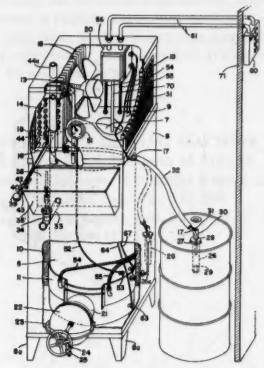
10. A method for generating and maintaining increased carbon dioxide tension in loosely capped culture vials utilizing an independent culture media support, which comprises inserting into such culture vials a tablet comprising about 25% to about 65% by weight of a carbon dioxide couple, about 30% to about 60% by weight of polyvinylpyrollidone and about 5% to about 15% by weight of a long chain fatty acid ester of a polyhydroxy alcohol.

3,891,510
INTEGRATED APPARATUS FOR DISTILLING BATCHES OF CONTAMINATED SOLVENTS

Frede Hilmar Drostholm, Vedbaek; Kaj Ditlev Frederik Petersen, Valby, and Ulf Raabo, Graested, all of Denmark, assignors to Frede Hilmar Drostholm, Denmark

Filed Apr. 18, 1973, Ser. No. 352,261
Int. Cl. B01d *3/42*
U.S. Cl. 202—206 **3 Claims**

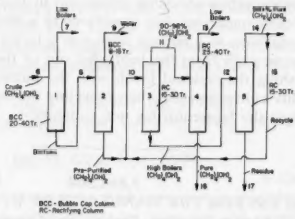
1. Equipment for cleaning solvents including a tank for containing a batch of liquid solvent for distillation at relatively lower pressure, and having an inlet for sequential introduction of batches of solvent to be distilled, means normally closing said inlet during distillation of the batches, electric heating means in heat exchange relation with a lower region of the tank, condensing means coupled to said tank, means providing for discharge of condensate into an associated condensate accumulation vessel, a power circuit for energizing said heating means, and safety control means for said power circuit, preventing energization of said heating means under abnormal conditions which might be hazardous to the equipment or its operator, said safety control means comprising: switch means responsive to the temperature of the liquid solvent in said tank, and operative to terminate the flow of current in said power circuit when the temperature exceeds a predetermined value; the condensate discharge means comprising a flexible condensate delivery connection having a discharge end portion adapted to be removably inserted into the top of an associated condensate accumulation vessel and a switch element carried by said discharge end portion of the flexible condensate delivery connection, the switch element being responsive to the accumulation of condensate in such an associated vessel, and operative to terminate the flow of current in said power circuit in response to rise in the level of the condensate accumulating in such vessel.



3,891,511
PRODUCTION OF VERY PURE BUTANEDIOL

Axel Danneil, Ludwigshafen; Erich Flickinger, Frankweiler; Heinz Graefje; Reinhold Plass, both of Ludwigshafen, and Rudolf Schnur, Frankethal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed July 17, 1972, Ser. No. 272,366
Int. Cl. B01d *3/00*
U.S. Cl. 203—81 **2 Claims**



1. In a process for the production of very pure butanediol-1,4 by distillation of crude butanediol containing as impurities water, methanol, propanol, butanol and small amounts of unsaturated compounds, aldehydes, cyclic ethers, acetals and triols and obtained by hydrogenation of an aqueous butyne-2-diol-1,4 solution and from which water and compounds having a boiling point of less than 120°C have been separated as distillate overhead to obtain a butanediol residue essentially free of water and compounds with boiling points of more than 120°C, the improvement which comprises separating said butanediol fraction in a first distillation column into an overhead fraction A constituting 60 to 90% by weight of said residue and containing butanediol and residual components

having a lower boiling point than butanediol and a fraction B constituting 40 to 10 percent by weight of said residue and containing butanediol and components having a higher boiling point than butanediol, recovering very pure butanediol-1,4 by separating fraction A in a second distillation column into an overhead product consisting of the impurity components having a lower boiling point than butanediol and a bottoms product consisting of said very pure butanediol-1,4, and separating fraction B in third distillation column into an overhead product consisting of more than 98 percent by weight of butanediol and residual impurities having a higher boiling point than butanediol.

3,891,512

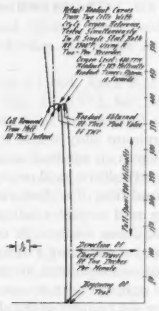
DETERMINATION OF OXYGEN IN MOLTEN STEEL

Paul L. Jackson, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 312,444, Dec. 6, 1972, abandoned. This application June 24, 1974, Ser. No. 482,719

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **3 Claims**



1. The process of determining the oxygen content of a molten metal comprising employing in an oxygen activity measuring cell a solid oxygen ion electrolyte; exposing said solid electrolyte on one side to molten metal and on the other to an oxygen reference material having a melting point higher than the melting point of the major component of the metal and which is a carbide selected from the carbides of silicon, titanium, chromium, niobium or tantalum; measuring the electrical potential developed across said solid electrolyte; and reading as a representation of the oxygen content of the molten metal, a single maximum value of the developed potential occurring within no more than 20 seconds after the oxygen activity measuring cell has been exposed to the molten metal.

3,891,513

ELECTRICAL COLORATION RECORDING SHEET

Akiyoshi Yasumori; Katsuichi Ohta, both of Yokohama; Makoto Kunikane, Tokyo, and Michiharu Abe, Kawasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

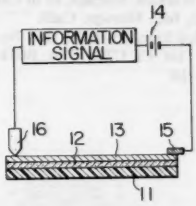
Filed July 27, 1973, Ser. No. 383,160

Claims priority, application Japan, Aug. 8, 1972, 47-79260

Int. Cl. B41m *5/20*; **G01d** *15/34*

U.S. Cl. 204—2 **16 Claims**

1. An electrical coloration recording sheet comprising an electrical coloration material layer and a thin electrically conductive material layer formed on said electrical coloration material layer, said electrical coloration material layer made of a material which changes color but is not destroyed at a point adjacent a point of the thin electrically conductive material layer to which a selected electrical signal is applied with



a recording electrode whereby a recorded likeness of an original may be produced on said sheet by selected electric signals.

3,891,514

METHOD TO PREPARE MATRICES TO MANUFACTURE LATTICE OR GRID METAL LAYERS STRUCTURES BY ELECTROLYTIC DEPOSITION

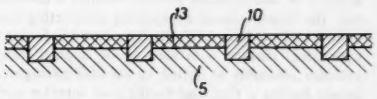
Martin Klemm, Gerlafingen, Switzerland, assignor to Fritz Buser AG. Maschinenfabrik, Utzenstorf, Switzerland

Filed Nov. 21, 1973, Ser. No. 417,978

Claims priority, application Switzerland, Nov. 28, 1972, 17330/72

Int. Cl. C23b *5/48*, *7/00*

U.S. Cl. 204—15 **15 Claims**



1. In a method to prepare matrices for the manufacture of lattice or grid or mesh metal layer structures, having openings of predetermined shape and size, including the steps of

forming a base body (5) with a surface having electrically conductive portions, in accordance with the solid portions of the grid or mesh structure, and electrically non-conductive portions in accordance with the interstitial openings between the solid portions of the grid and mesh structure, electrolytically depositing a metal layer on the conductive portions, and then removing said metal layer, the improvement wherein

the base body is of electrically conductive material;

and the step of forming said base body (5) comprises the steps of

forming depressions (6, 18) in the surface of the body (5) having a shape, size and surface distribution corresponding to the electrically conductive portions of the surface of the body by penetrating into the material of the base body (5);

substantially completely filling said depressions with electrically conductive filler material (10, 15, 19);

removing a portion of the material adjacent the filled depressions to form depressed portions (12, 16, 20) adjacent the filler material (10, 15, 19), which filler material will form projecting ridges;

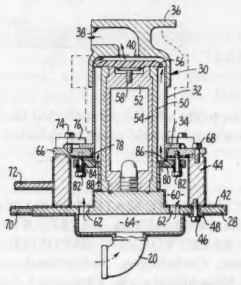
filling the depressed portions (12, 16, 20), between said ridges (10, 15, 19), and corresponding to the electrically non-conductive portions with a layer of insulating material (13, 17) extending between the electrically conductive ridges of filler material filling said depressions;

and smooth working the surface of the body with said ridges and insulating material therebetween after said last filling step to provide a uniform, substantially smooth overall surface.

3,891,515
METHOD FOR PLATING AIRCRAFT CYLINDERS

Peter C. Paulson, Pinole; Henri H. Henderson, Oakland, and Richard L. Worstell, Moraga, all of Calif., assignors to Electro-Coatings, Inc., Moraga, Calif.

Filed Mar. 23, 1973, Ser. No. 344,142
Int. Cl. C23b 5/56; B01k 1/00
U.S. Cl. 204—26 3 Claims



1. In the method of plating aircraft engine cylinder assemblies where said assemblies include a ferrous cylinder portion with an interior cylindrical surface and a head portion joined to said cylinder portion at one end thereof with said head portion having an interior surface which with the interior surface of said cylinder portion defines a combustion chamber, the improvement comprising supporting a substantially cylindrical anode in said cylinder assembly facing said interior cylindrical surface with said anode spaced away from said cylinder assembly to define an annular passageway with said anode having a free end facing said interior surface of said head portion, shielding said anode in the area of said head portion with a shield mounted on said free end of the anode and having edges projecting radially outwardly from the anode to a position closely adjacent to the end of said cylinder at the head to prevent current flow between the interior surfaces of said head portion and the surfaces of said anode adjacent thereto, pumping a chromium plating electrolyte into said annular passageway generally axially of said cylinder with said electrolyte contacting said interior surface of said head portion, and passing a direct electrical current between said anode and said cylinder assembly.

3,891,516
PROCESS OF ELECTROLYICALLY ANODIZING A MECHANICALLY GRAINED ALUMINUM BASE AND ARTICLE MADE THEREBY

Simon L. Chu, Dobbs Ferry, N.Y., assignor to Polychrome Corporation, Yonkers, N.Y.

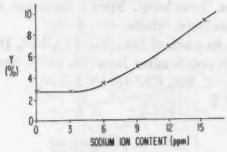
Continuation of Ser. No. 60,625, Aug. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 670,403, Sept. 25, 1967, abandoned. This application May 21, 1973, Ser. No. 362,359
Int. Cl. C23b 9/02
U.S. Cl. 204—33 11 Claims

1. A method for making an aluminum supporting base adapted to receive a light sensitive coating thereon to make a lithographic plate which comprises first graining a surface of an aluminum sheet with a wet graining mass comprised of fine abrasive particles of pumice, and then anodizing the grained surface of said aluminum sheet in a sulfuric acid solution having a concentration of about 8 to about 22 percent, by a direct current applied at a voltage of about 10 to 20 volts and at a current density of about 10 to about 20 amperes per square foot, to form a hard, substantially lusterless surface on said sheet.

3,891,517
PROCESS FOR ELECTROLYTIC COLORING OF ALUMINUM CR ALUMINUM ALLOY ARTICLES

Kiyomi Yanagida; Tadashi Hirokane; Tadashi Tsukiyasu, and Tomoari Sato, all of Nagoya, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Mar. 20, 1974, Ser. No. 453,122
Claims priority, application Japan, Mar. 20, 1973, 48-32027; Nov. 22, 1973, 48-13199
Int. Cl. C23b 5/52, 9/02
U.S. Cl. 204—35 N 13 Claims



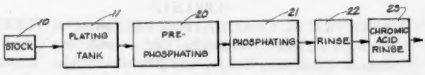
1. In a process for coloring an anodic oxidized film on an aluminum or aluminum alloy article by subjecting said article to anodic oxidation in an aqueous anodic oxidation bath consisting essentially of sulfuric acid or an aromatic sulfonic acid to form an oxidized film of a thickness of at least 6 microns and electrolyzing said anodic oxidized article as a cathode immersed in an aqueous electrolytic coloring bath containing a water soluble nickel salt using a direct current, the improvement which comprises obtaining an anodic oxidized film colored a stable and uniform deep brown which comprises maintaining the sodium ion content in the electrolytic coloring bath below 12 ppm.

5. The process according to claim 1, wherein the content of said sodium ion in said aqueous electrolytic coloring bath is maintained at less than 12 ppm by passing said aqueous electrolytic coloring bath through a column of an Ni-type strongly acidic cation exchange resin to substantially remove sodium ion and recycling the aqueous electrolytic coloring bath having a low sodium ion content.

3,891,518
METHOD OF ELECTROPLATING UTILIZING ZINC DROSS ANODES

Edward R. Burwick, Miamisburg, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Oct. 16, 1974, Ser. No. 515,353
Int. Cl. C23b 5/50, 5/58; B01k 3/06
U.S. Cl. 204—35 R 8 Claims



1. In a method of electrodepositing zinc on steel wherein the steel stock is passed through a plating tank between zinc anodes submerged in an aqueous plating solution, with the stock acting as a circuit forming cathode, and an electrical charge is imposed through the anodes to effect plating, the improvement which comprises the step of plating the stock with zinc utilizing anodes consisting of zinc dross.

3,891,519
SURFACE TREATMENT OF ALUMINIUM AND ALUMINIUM ALLOYS

Bernard Grellet, Saint-Etienne, France, assignor to Centre Stephanois de Recherches Mechaniques Hydromecanique et Frottement, Andrezieux-Boutheon, France

Filed Sept. 9, 1974, Ser. No. 503,936
Claims priority, application France, Sept. 14, 1973, 73.33031
Int. Cl. C23b *5/52, 5/46;* **B23p** *3/00*
U.S. Cl. 204—37 R **10 Claims**

1. A process for the treatment of the surface of aluminium or an aluminium alloy, comprising the steps of

a. depositing a copper-indium alloy layer on the said surface by electrolysis in a bath containing, an alkaline solution, monovalent copper ions, trivalent indium ions, an alkali metal hydroxide, an alkali metal cyanide, an alkali metal gluconate, gluconic acid, and oxalic acid, and

b. subjecting the coated surface to a diffusion heat treatment at a temperature between 120° and 155°C.

3,891,520
ACID, GALVANIC ZINC BATH

Hans-Günther Todt, and Günter Voss, both of Berlin, Germany, assignors to Schering AG, Berlin & Bergkamen, Germany

Continuation of Ser. No. 27,164, April 9, 1970, abandoned. This application Jan. 29, 1973, Ser. No. 327,841
Int. Cl. C23b *5/12*
U.S. Cl. 204—55 R **4 Claims**

1. An acid, galvanic zinc bath for the deposition of bright to high luster zinc coats consisting essentially of an aqueous solution of pH from about 3.0 to 6.0 containing a zinc salt selected from the group consisting of zinc chloride, zinc sulfate, zinc acetate, zinc fluoborate and zinc sulfamate in a concentration from about 50 to 200 grams per liter, other conducting salts selected from the group consisting of ammonium chloride, ammonium sulfate, sodium chloride, and sodium sulfate in a concentration from about 50 to 300 grams per liter, and luster forming compounds selected from the group consisting of (a) polyethylene glycol of mean molecular weight from about 280 to 22,000, in a concentration from about 0.1 to 20.0 grams per liter and (b) at least one ketone selected from the group consisting of acetophenone, ethinylphenylketone, propiophenone, benzalacetone, 2-hydroxybenzalacetone, 3-methoxybenzalacetone, benzoylacetone, benzoylacetonitrile, 3-acetylpyridine, 2,4-dihydroxy-benzophenone, benzalacetophenone, dibenzalacetone, 2-benzolypyridine, 3-bezoylpridine, 4-benzolypyridine, benzoylacetic acid ethyl ester, 1-(2-furyl)-1'-buten-3-one, thienylideneacetone, di-thienylidene-acetone, 3-acetylcumarine, 4-acetylcumarine, and 6-acetylcumarine in a concentration of about 0.01 to 5.0 grams per liter.

3,891,521
OPENING OF MOLYBDENITE ORES AND THE ELECTROWINNING OF RHENIUM

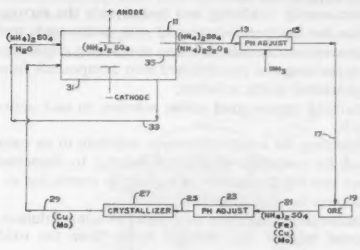
William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 322,649, Jan. 11, 1973, Pat. No. 3,816,588. This application Feb. 7, 1974, Ser. No. 440,636
Int. Cl. C22d *1/00*
U.S. Cl. 204—105 R **1 Claim**

1. A method for recovery of rhenium in molybdenite bearing ores, which method comprises the steps of:

a. forming a rhenium concentrate as an essentially insoluble solid by contacting the molybdenite bearing ore with a solution of ammonium or a stable alkali metal or alkaline earth persulfate for a time sufficient to convert at least part of the molybdenum, and other persulfate soluble metals to their soluble form, and

b. separating the insoluble rhenium concentrate from the persulfate solution, and



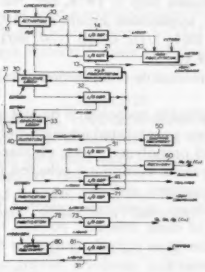
c. solubilizing the rhenium obtained from step (b), and

d. recovering rhenium from the solution of step (c) by electrodeposition.

3,891,522
HYDROMETALLURGICAL PROCESS FOR TREATING COPPER-IRON SULPHIDES

Donald R. McKay, and Godefridus M. Swinkels, both of Rossland, Canada, assignors to Cominco Ltd., Trial, Canada

Continuation-in-part of Ser. No. 229,737, Feb. 28, 1972, abandoned. This application Jan. 31, 1974, Ser. No. 438,314
Int. Cl. C22d *1/16;* **C22b** *15/08, 15/12;* **C01g** *3/12*
U.S. Cl. 204—108 **37 Claims**



1. A process for treating copper-iron sulphide concentrate for the recovery of copper and sulphur values whicih comprises leaching copper-iron sulphide concentrate with an acidic solution containing sulphuric acid in a concentration in the range of from about 15 g/1 to about 250 g/1 and metallic copper having a particle size smaller than 65 mesh to convert the copper-iron sulphides in said concentrate to insoluble simple copper sulphide and a solution of ferrous sulphate and recovering copper and sulphur values from said simple copper sulphide.

9. A process for treating copper-iron sulphide concentrate to extract copper values and elemental sulphur therefrom which comprises the steps of:

1. reacting said concentrate sulphide with an acidic solution containing sulphuric acid in a concentration in the range of from about 15 to 250 grams per litre and metallic copper having a particle size smaller than 65 mesh in an activation leach at a temperature in the range of from about 60°C. to the boiling point of the reaction mixture, and maintaining the amount of metallic copper to soluble iron at a molar ratio of about unity, for the production of

an insoluble simple copper sulphide and a solution of ferrous sulphate;

2. separating the solution of ferrous sulphate from the insoluble copper sulphide;
3. concurrently oxidizing and hydrolyzing the ferrous sulphate for the precipitation of iron compounds and the regeneration of acidic solution containing sulphuric acid;
4. separating the precipitated iron compounds from the regenerated acidic solution;
5. returning regenerated acidic solution to said activation leach;
6. subjecting the insoluble copper sulphide to an oxidizing leach for oxidation of sulphide sulphur to elemental sulphur and for dissolution of copper as cupric ion to form a copper-bearing solution;
7. discharging a mixture of copper-bearing solution, elemental sulphur and residual solids from the oxidizing leach; and
8. recovering copper values from said copper-bearing solution.

35. In a process as claimed in claim **9**, recovering copper values from said copper-bearing solution by electrowinning for the production of metallic copper and return acid.

3,891,523

PHOTOPOLYMERIZABLE, ISOCYANATE-CONTAINING PREPOLYMERS

Hiroyoshi Hisamatsu, Saitama-ken; Katutoshi Takahashi, and Masanori Takase, both of Urawa, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

Continuation of Ser. No. 107,515, Jan. 18, 1971, abandoned. This application July 3, 1974, Ser. No. 485,636

Claims priority, application Japan, Jan. 19, 1970, 45-4451

Int. Cl. B01j *1/10;* **C08d** *1/10;* **B01l** *1/12*

U.S. Cl. 204—159.15 **7 Claims**

1. A photopolymerizable composition consisting essentially of:

a. photopolymerizable prepolymer having isocyanate group and at least one unsaturated addition-polymerizable double bond, said prepolymer being obtained by reacting
   i. a polyisocyanate compound selected from organic di- and triisocyanates, with
   ii. a polyhydroxy compound selected from the group consisting of diols, trihydric polyols, tetrahydric polyols, polyester type polyols, polyether type polyols and partially esterified products having at least two hydroxyl groups obtained by reacting a tri-tetrahydric polyol with a monocarboxylic acid, at such a ratio that the hydroxyl group is less than one equivalent with respect to one equivalent of the isocyanate group, and then reacting the reaction product with
   iii. an unsaturated addition-polymerizable compound having a hydroxyl group selected from the group consisting of partially esterified products obtained by reacting a diol with acrylic acid or methacrylic acid, partially esterified products obtained by reacting a diol with acrylic acid or methacrylic acid, partially esterified products obtained by reacting a tri- or tetrahydric polyol with acrylic acid or methacrylic acid, partially esterified products obtained by reacting a polyether type polyol with acrylic acid or methacrylic acid, N-hydroxy-methyl-acrylamide and N-hydroxymethyl-methacrylamide,

   at such a ratio that the hydroxyl group is less than one equivalent with respect to one equivalent of the isocyanate group remaining in the reaction product; and

b. 0.001 to 15 parts by weight of a photosensitizer per 100 parts by weight of (a), the amount of isocyanate groups contained in said prepolymer being 0.3 to 15% based on the total weight of said components (a) and (b).

3,891,524

BUTYRIC ACID DERIVATIVES AS PHOTOSENSITIZERS FOR UNSATURATED COMPOUNDS

Hans Rudolph, Krefeld-Bockum; Hans-Georg Heine; Karl Fuhr, both of Krefeld, and Hermann Schnell, Krefeld-Uerdingen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

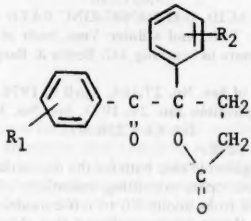
Division of Ser. No. 411,422, Oct. 13, 1973, which is a division of Ser. No. 867,939, Oct. 20, 1969, Pat. No. 3,824,284. This application Aug. 27, 1974, Ser. No. 501,188

Claims priority, application Germany, Nov. 6, 1968, 1807301

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 204—159.15 **10 Claims**

1. In the process of preparing coatings and molded bodies by photopolymerizing a mixture of at least one ethylenically unsaturated polymerizable compound and a photosensitizer by irradiating said mixture with a radiation source, the improvement which comprises employing 0.1 to 5 percent by weight, based on said ethylenically unsaturated compound, of a photosensitizer of the formula



wherein R_1 and R_2 are identical or different and are selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, methoxy and halogen.

3,891,525

METHOD OF ELECTRO-DEPOSITING COMPOSITIONS CONTAINING HYDROLYZED POLYEPOXIDES

James Irwin, New Kensington, and J. Alden Erikson, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 5, 1970, Ser. No. 61,498

Int. Cl. B01k *5/02*

U.S. Cl. 204—181 **10 Claims**

1. A method of coating a conductive substrate which comprises passing electric current between an electrically conductive anode and an electrically conductive cathode in contact with a water-dispersed coating composition comprising:

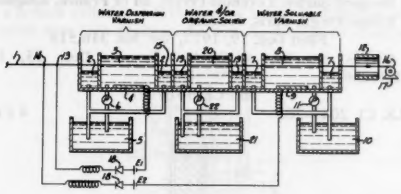
a. from about 95 percent to about 50 percent by weight, based on the total of (a) and (b) herein, of an at least partially neutralized interpolymer of from about 1 percent to about 20 percent by weight of a hydroxyalkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid, from about 1 percent to about 20 percent by weight of an unsaturated acid, and at least one other copolymerizable ethylenically unsaturated monomer;
b. from about 5 percent to about 50 percent by weight of an aminealdehyde condensation product; and
c. from about 1 percent to about 25 percent by weight based on the total of (a) and (b) of hydrolyzed polyepoxide consisting essentially of a polyol obtained by hydrolysis of a polyepoxide so as to convert the oxirane rings thereof into hydroxyl groups.

3,891,526

METHOD OF ELECTROCOATING ELECTRIC WIRE

Shigeo Masuda, Osaka, and Toshihiko Tanaka, Nagoya, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 11, 1971, Ser. No. 114,475
Claims priority, application Japan, Feb. 14, 1970, 45-12443; Aug. 19, 1970, 45-72646
Int. Cl. B01k 5/02
U.S. Cl. 204—181 2 Claims



1. The method of manufacturing insulated electric wire comprising the steps of coating a conductor with a water dispersion varnish by electrophoresis, then treating the film coating with a liquid selected from the group consisting of an organic solvent and a mixed liquid of water and water-soluble organic solvent, and further coating the conductor with a water-soluble varnish by electrophoresis, and then baking the coated conductor.

3,891,527

WATER-DISPERSIBLE CATIONIC POLYURETHANE RESINS

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 162,659, July 14, 1971, Pat. No. 3,804,786. This application Mar. 29, 1972, Ser. No. 239,305
Int. Cl. B01k 5/02
U.S. Cl. 204—181 10 Claims

1. A method of electrodepositing a hard impact resistant and corrosion resistant film on the cathode of a unidirectional electrical system comprising passing a unidirectional electrical current through an aqueous coating composition comprising water having dispersed therein an hydroxy functional cationic resin comprising an adduct of a resinous polyepoxide having a molecular weight in the range of about 600 to about 6000 and an hydroxy value of from about 0.2 to about 0.4, a stoichiometric deficiency of organic polyisocyanate and a monosecondary amine in an amount to consume substantially all of the epoxy functionality of said polyepoxide, said cationic resin being dispersed in the water by means of an acid, and then through said cathode to deposit a resin film thereon, and baking said film to cure the same.

3,891,528

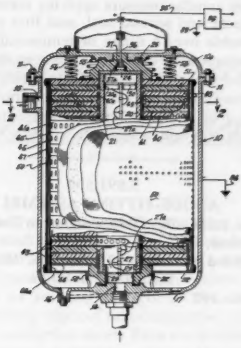
ELECTROSTATIC FILTERING FOR CLEANING DIELECTRIC FLUIDS

Edward A. Griswold, Pasadena, Calif.

Division of Ser. No. 93,363, Nov. 27, 1970, which is a continuation-in-part of Ser. No. 538,275, March 29, 1966, Pat. No. 3,544,441, which is a division of Ser. No. 190,457, April 26, 1962, Pat. No. 3,252,885. This application Feb. 26, 1973, Ser. No. 335,554
Int. Cl. B03c 5/00
U.S. Cl. 204—186 17 Claims

1. The method of removing electrically charged particles suspended in a stream of a dielectric fluid in a porous region laterally bounded by spaced and housed electrodes, that includes the steps of:

a. flowing the stream of fluid with particles suspended therein along a path within said porous region;
b. maintaining a high-intensity unidirectional electrostatic field across the fluid path between surfaces of the laterally spaced electrodes;
c. effecting a change in velocity of the fluid stream by controlling the net cross-sectional area of the porous region



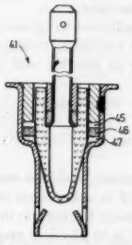
available to the fluid stream in said field wherein the suspended particles migrate toward a boundary of the region;
d. receiving the migrating particles on stationary structure defining the porous region; and
e. maintaining at least a substantial portion of said surfaces coated with material exposed to said fluid stream and having a high dielectric value and electrical resistance.

3,891,529

ELECTROCHEMICAL OXYGEN SENSOR, ESPECIALLY FOR MOTOR EXHAUST GAS ANALYSIS

Otto Beesch, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 10, 1974, Ser. No. 432,248
Claims priority, application Germany, Jan. 30, 1973, 2304359
Int. Cl. G01n 27/46
U.S. Cl. 204—195 S 2 Claims



1. Electrochemical sensor for determination of the oxygen content of hot gas, such as engine exhaust gas, comprising:
a tube (11) of solid electrolyte closed at one end;
electron conducting layers, one on the inner surface and one on the outer surface of said tube, forming inner and outer electrodes respectively;
a connection member (32) electrically connected to said inner electrode and of a form of construction such as to admit ambient air to the inner surface of said tube;

a casing (21) electrically connected to said outer electrode and surrounding the circumference of said tube over at least a major part of its length;

a first seal (35) of an electrically conducting sealing material between said connection member and said inner surface encircling said connection member;

a second seal (27) consisting of an annular mass of graphite powder between said casing and said outer surface encircling said tube, and

at least one annular pressure applying means for compressing at least said second seal, said first and second seals being stable over a range of temperature including the temperature range of the gas being examined,

said second seal (27) being of a yielding character even after compression by said pressure applying means and providing an electrical connection between said outer electrode and said casing.

3,891,530

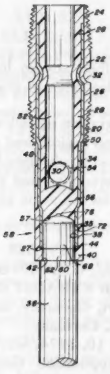
ANODE-FITTING ASSEMBLY

Sam Alewitz, Painesville, Ohio, assignor to Perfection Corporation, Madison, Ohio

Filed Nov. 29, 1972, Ser. No. 310,561

Int. Cl. C23f *13/00*

U.S. Cl. 204—197 **15 Claims**



1. An anode-fitting assembly for a water heater or the like comprising in combination:

a fitting member adapted to be secured to the wall of such water heater in electrical contact therewith, said fitting member having an interior wall defining a recess at one end thereof;

an anode member comprising:

an electrode,

a joining member received about one end of said electrode,

said joining member and said one end of said electrode being disposed in said recess of said fitting member,

said joining member having a cylindrical portion the inner wall of which is in physical and electrical contact with the exterior surface of said electrode and the exterior wall of which is in physical and electrical contact with said wall defining said recess of said fitting member such that with said electrode assembled to said fitting member said cylindrical portion is entirely received within said recess and, in a radial direction, is located between said electrode and said fitting member and provides an electrical interconnection between said electrode and said fitting member,

the relationship of said anode member to said fitting member being such that with said joining member received within said recess fluid in such water heater is substantially prohibited from contact with said one end of said electrode, said joining member and said wall defining said recess of said fitting member.

3,891,531

ELECTROLYTIC DIAPHRAGM CELLS INCLUDING CURRENT CONNECTION MEANS BETWEEN THE CELL BASE AND ANODE

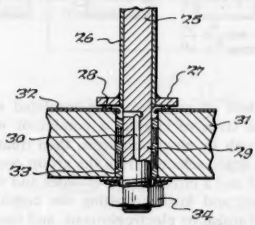
Pierre Bouy, Enghien-les-Bains; Daniel Masure, La Madeleine; Paul Collon, Autreville; Jean-Marie Pigeaud, Martigues, and Bernard Sartre, Levallois-Perret, all of France, assignors to Rhone-Progil, Paris, France

Filed Dec. 19, 1972, Ser. No. 316,515

Claims priority, application France, Dec. 23, 1971, 71.46296

Int. Cl. B01k *3/10*

U.S. Cl. 204—263 **4 Claims**



1. An electrolytic diaphragm cell comprising a plurality of vertical substantially flat and hollow anodes formed, as regards at least one of their two substantially parallel faces, by a sheet of a film-forming metal, said anodes being secured to the base of the cell by means of extended portions which pass through the base, characterized in that the extended portions comprise a core made of a metal which is a good electrical conductor, which core is covered by a sheath made of a film-forming metal, a good electrical contact being ensured between the sheath and the core, said base of the cell being of metal, which base is covered with a sheet of film-forming metal, said core of said extended portions is exposed where it passes through the base of said cell, the electrical connection is made by means of metal parts arranged between said core and said base and resting resiliently against said core and said base.

3. An electrolytic diaphragm cell according to claim **1**, wherein said extended portion is provided with a channel communicating with the top of said base and a point of discharge below said base.

3,891,532

ELECTROLYTIC CHEMICAL REACTION APPARATUS

Gerald A. Jensen, Wayzata, Minn., and Harry N. Parsonage, Washington Twp., Montgomery County, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 30, 1973, Ser. No. 420,699

Int. Cl. B01k *3/10*

U.S. Cl. 204—260 **22 Claims**

19. Apparatus for the electrolytic regeneration of alkali ferrocyanide bleach to alkali ferricyanide bleach comprising:

1. a cylindrical outer housing

2. an annular anode, having an inside diameter of aprpoximately four inches and a height of approximately three feet, located within said housing, only the interior surface of said anode being active, said interior surface having approximately three square feet of active surface area,

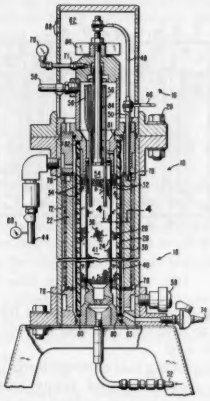
3. a cation exchange membrane arranged concentrically within and spaced from said anode,

said membrane and said interlock surface of said anode defining an anode chamber for flowing said bleach,

said membrane being supported by a porous tubular support member which has a fiberglass layer thereon, said membrane and said fiberglass layer being attached to said porous tubular support member by a nylon cord wrapping,

said member being non-porous at its ends and having an annular elastomeric insert at each end, said membrane being laid over said inserts, a fine nylon cord wrapped over said membrane and around said member in the area of said inserts so as to compress the membrane tightly against said inserts and effectively seal the ends of said membrane to said member, and said membrane defining the outside of a cathode chamber,

4. a hollow cylindrical cathode two inches in diameter and three feet high positioned within said cathode chamber



and spaced from said membrane and said support, both surfaces of said cathode being active, providing approximately three square feet of active surface area,

5. wetproofed catalyst particles arranged on both sides of said hollow cylindrical cathode and confined inside said membrane support member,

6. sealing means at the ends of said outer housing, annular anode, membrane support member, and cathode so as to form a closed system,

7. inlet means, to said anode chamber, for introducing an aqueous solution of an alkali ferrocyanide bleach into said anode chamber,

8. outlet means, from said anode chamber for the exit of the regenerated bleach,

9. pressure gauges attached to both said inlet and outlet means,

10. valve means attached to said anode chamber outlet to control the back pressure within said anode chamber,

11. inlet means to said cathode chamber for introducing oxidizing air into the cathode chamber for reaction with any hydrogen gas by-product produced at said cathode during electrolysis,

12. outlet means from said cathode chamber for exit of any by-products produced as well as any excess air introduced,

13. pressure gauges attached to both said cathode chamber inlet and cathode chamber outlet,

14. valve means attached in said cathode chamber outlet to control the back pressure within said cathode chamber, whereby it is possible to maintain a back pressure within said cathode chamber which is less than the back pressure within said anode chamber and, thu, keep said cation exchange membrane tight against said membrane support member, and

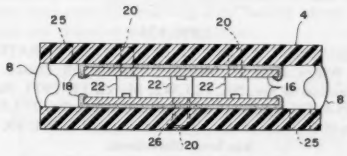
15. electrical means for supplying an electrical potential across said anode and said cathode.

3,891,533

ELECTROLYTIC CELL STRUCTURE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of David F. Putnam, Myrtle Creek, Oreg., and Richard L. Vaughan, Long Beach, Calif.

Filed Feb. 8, 1974, Ser. No. 440,916
Int. Cl. B01k *3/00*
U.S. Cl. 204—267 **5 Claims**



1. In an electrolytic cell assembly comprising a plurality of spaced parallel insulating plates, with adjacent plates defining flow paths therebetween, said plates having electrically conductive sheets secured thereto, the improvement comprising:

adhesive means for securing said conductive sheets to said plates and for sealing edges of said conductive sheets thereby protecting said conductive sheets from electrolytic attack;

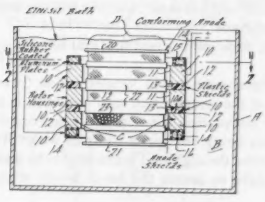
headed screw means of insulating material for securing each of said conductive sheets to its respective plate and for preventing buckling of said conductive sheet by maintaining adhesion between said conductive sheet, said adhesive means and said insulating plate and for maintaining a predetermined spacing between said plates; and resilient gasket means between said adjacent plates defining predetermined flow paths therebetween.

3,891,534

ELECTROPLATING SYSTEM FOR IMPROVING PLATING DISTRIBUTION OF ELNISIL COATINGS

Leonard G. Cordone, Allen Park; William A. Donakowski; John R. Morgan, both of Dearborn Heights, and Karl Roemming, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 5, 1973, Ser. No. 413,154
Int. Cl.[2] C25B *9/00*; **C25D** *7/04*
U.S. Cl. 204—272 **15 Claims**



1. In an electroplating system for cathodically electroplating an article wall having a uniform curvature interrupted by a reverse curvature at least at one location, a semi-conforming anode assembly, comprising:

a. an anodically inert enclosure having a conductive foraminous wall predominantly conforming proportionately to the wall of said article excepting said reverse curvature when disposed adjacent thereto, said foraminous wall having at least one portion shaped predominantly to conform with said uniform curvature of said article wall and at least one other portion which extends adjacent the

reverse curvature and extends beyond the start of said reverse curvature of said article, said other portion progressively deviating away from conformity with said reverse curvature and having a maximum deviation at a station aligned with an extension of a radius of said reverse curvature passing through the mid-point of said reverse curvature, and

b. a plurality of anodically active metal pieces in said enclosure in interengagement with each other and with said enclosure.

3,891,535

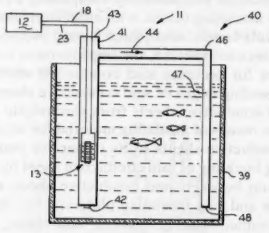
AQUARIUM WATER TREATMENT APPARATUS

Arnold Wikey, 5040 W. Newport, Chicago, Ill. 60641

Continuation of Ser. No. 123,342, March 11, 1971, Pat. No. 3,720,014. This application July 9, 1973, Ser. No. 377,597The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.

Int. Cl. C02b *1/82;* **B01k** *3/00;* **C02b** *3/00*

U.S. Cl. 204—275 **4 Claims**



1. Water treatment apparatus for aerating and sterilizing fish tanks,

said apparatus comprising at least one pair of electrodes immersed in said fish tank,

said electrodes being juxtaposed but non-contiguous to one another,

a low voltage source for oppositely polarizing said electrodes to cause electrolysis of the water to release gases for simultaneously sterilizing and aerating the water,

means for periodically changing polarization to maintain the gaseous discharge at said electrodes,

tube means surrounding said electrolysis unit in said fish tank,

said tube means comprising a first vertical tube opened at the bottom thereof,

said tube means further comprising a second vertical tube, said second vertical tube closed at the top and open at the bottom thereof,

a horizontal tube joining said first and second vertical tubes, and

said horizontal tube being located so as to be below the surface of the water when said fish tank is in operation, whereby circulation for aeration is accomplished by the electrodes being energized to force water from said first vertical tube through said horizontal tube and said second vertical tube to aerate the lower levels of said fish tank.

3,891,536

SPUTTER-COATING APPARATUS

Hans-Joachim Gläser, Gelsenkirchen, and Hans-Werner Brandt, Witten, both of Germany, assignors to Flachglas Aktiengesellschaft DELOG-DETAG, Auf der Rhine, Germany

Filed Oct. 9, 1973, Ser. No. 404,677

Claims priority, application Germany, Oct. 7, 1972, 2249297; Oct. 7, 1972, 7236940

Int. Cl. C23c *15/00*

U.S. Cl. 204—298 **4 Claims**

1. A sputter-coating apparatus comprising:

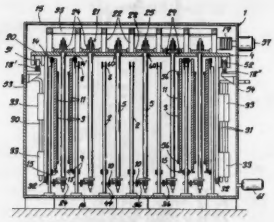
a gastight chamber having a bottom wall;

suction means connected to said chamber for at least partially evacuating same;

an upright workpiece support in said chamber including at least one upper horizontal rail, at least one lower horizontal rail below and parallel to said upper rail and secured to said bottom wall, and a plate suspended rollingly on said upper rail and bearing laterally on said lower rail, a sheet-like workpiece being retainable in an upright position on said plate between said upper rail and said lower rail;

a horizontal guide on said support below said lower rail;

a horizontally displaceable carriage in said chamber above said upper rail;



a rack of sputter-coating electrodes having an upper end attached to said carriage and a lower end engaged with said guide; and

means for displacing said carriage horizontally in said chamber with said lower end riding along said guide and thereby moving said electrodes past said sheet-like workpiece while sputtering a coating thereon, said electrode rack including a plurality of elongated vertical electrodes and upper and lower cross members interconnecting said electrodes at said upper and lower ends of said rack, said lower cross members being provided with a plurality of laterally projecting rollers rotatable about vertical axes and engaging said guide beneath said plate.

3,891,537

ELECTROSTATIC SEPARATING APPARATUS

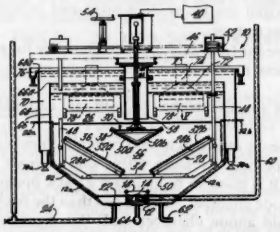
Toshiyuki Tokumoto, 1994-3 Icchome, Nakatomigaka, Nara, Japan

Filed Oct. 30, 1973, Ser. No. 411,156

Claims priority, application Japan, Nov. 1, 1972, 47, 109971; Nov. 9, 1972, 47-112339; Nov. 15, 1972, 47-115081

Int. Cl. B03c *5/02, 5/00*

U.S. Cl. 204—308 **4 Claims**



1. An electrostatic separating apparatus for separating oil, floatable foreign bodies and water from waste liquid, comprising:

a separator tank adapted to contain a liquid dielectric solvent,

being capable of dissolving oil, having a specific gravity greater than that of water and capable of defining a substantially distinct level at its upper surface;

inlet means in said separator tank at its bottom adapted to introduce said waste liquid into said separator tank as a multiplicity of droplets;

a pair of electrodes in said separator tank, positionable to be within said solvent and defining an interelectrode space, said electrodes connectable to a substantially high voltage D.C. potential in order to produce an electrostatic field in said interelectrode space such that when waste liquid is introduced through said inlet means, said waste liquid is separated into oil, floatable foreign bodies and water due to an electrophoretic effect of said electrostatic field, said oil being substantially dissolved in said solvent near said upper surface thereof, said floatable foreign bodies forming a substantially distinct layer above the level of said solvent and said water forming a substantially distinct layer aobve the layer of floatable foreign bodies;

first outlet means positionable on said separator tank slightly below the upper surface of said solvent for discharging oil-containing solvent;

second outlet means disposed above the upper surface of said solvent for discharging floatable foreign bodies separated from said waste liquid in said separator tank;

third outlet means disposed above the level of said floatable foreign bodies for discharging water separated from said waste liquid in said separator tank; and

a drain conduit assembly in communication with said first outlet means, said drain assembly comprising:

an upflow conduit in direct flow communication with said first outlet means,

a downflow conduit,

a plurality of intermediate branch conduits positionable above the upper surface of the solvent and connecting said upflow conduit and said downflow conduit in flow communication with each other at different levels above the upper surface of said solvent, and

ON-OFF valves in said branch conduits for selectively opening and closing said branch conduits in order to maintain the upper surface of said solvent at a substantially fixed level regardless of inflow of waste liquid into the tank, such that said floatable foreign bodies are discharged through said second outlet means, said water is discharged through said third outlet means and said oil-containing solvent near the upper surface of said solvent is discharged through said first outlet means in flow communication with said drain conduit assembly.

3,891,538

INTEGRATED HYDROCARBON CONVERSION PROCESS

John E. Walkey, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

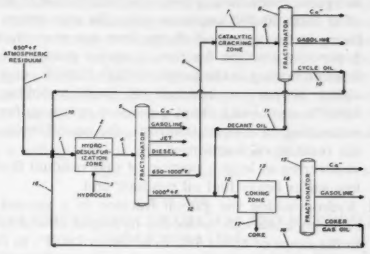
Filed June 21, 1973, Ser. No. 372,117
Int. Cl. C10g *37/06*
U.S. Cl. 208—50 **2 Claims**

1. In a process wherein an atmospheric residuum hydrocarbon stock containing sulfur and substantial quantities of materials boiling above 1000°F. is hydrotreated in a hydrotreating zone, a low sulfur gasoline product and a low sulfur jet fuel product are recovered from the effluent from said hydrotreating zone, a low sulfur portion of said effluent is catalytically cracked in a catalytic cracking zone; at least a portion of said effluent boiling above 1000°F. is coked in a coking zone, a gasoline product is recovered from the effluent from said catalytic cracking zone, a portion of the effluent from said catalytic cracking zone is recycled to said hydrotreating zone, and a gasoline product is recovered from the effluent from said coking zone, the improved method of optimizing the operating efficiency of the combination of said hydrotreating, catalytic cracking and coking zones which comprises:

1 limiting to 800°F. the end point of said portion of said effluent from said catalytic cracking zone that is recycled to said hydrotreating zone;

2 passing to said coking zone and coking the portion of said effluent from said catalytic cracking zone that boils above 800°F.;

3 recovering coke from said coking zone in increased yield compared with the yield if the portion of said effluent from said catalytic cracking zone boiling above 800°F. were not coked in said coking zone;



4 recycling from said coking zone to said hydrotreating zone a coker gas oil in increased amount compared with the amount available for such recycle if the portion of said effluent from said catalytic cracking zone boiling above 800°F. were not coked in said coking zone;

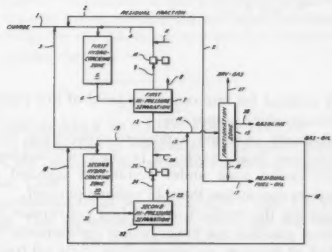
whereby there is obtained increased coke yield, increased coker gas oil for recycle to said hydrotreating zone, and improved desulfurization efficiency in said hydrotreating zone, with a resulting increased efficiency of operation of the combination of said hydrotreating, catalytic cracking and coking zones.

3,891,539

HYDROCRACKING PROCESS FOR CONVERTING HEAVY HYDROCARBON INTO LOW SULFUR GASOLINE

Gerald Verdell Nelson, Nederland, Tex., and Glenn Cooper Wray, Dyersburg, Tenn., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 212,565, Dec. 27, 1971, abandoned. This application Feb. 25, 1974, Ser. No. 445,365
Int. Cl. B01j *11/82*; **C10g** *13/02*
U.S. Cl. 208—59 **13 Claims**



1. A hydrocracking process wherein heavy hydrocarbon oil charge containing 0.1 to 8 percent sulfur, 100 to 1000 ppm

and more nitrogen, and 100 ppm and more compounds of nickel, vanadium, iron, and copper, and comprising from about 10 to 50 volume percent residual fraction boiling above 1000°F. are converted into a major portion of gasoline containing less than 100 ppm sulfur and nitrogen, and a minor portion of residual fuel oil containing about 1 percent or less sulfur; which process comprises:

a. hydrocracking heavy hydrocarbon oil charge, in a first hydrocracking zone, with molecular hydrogen at a temperature in the range of from about 700°–850°F. in the presence of a sulfur and nitrogen resistant hydrocracking catalyst comprising a hydrogenation component supported upon a cracking base consisting of an amorphous inorganic oxide having pore size distribution in the range of at least **20-200** angstrom units for conversion of said heavy hydrocarbon oil charge into not more than about 5 percent gasoline fraction, a major portion of gas-oil fraction boiling in the range of 430°–1000°F., and at least about 10 percent residual oil fraction boiling above 1000°F. containing about 1 percent or less sulfur;

b. separating, in a separation zone, the gas-oil fraction from the residual oil fraction;

c. recovering at least a portion of said residual fraction as low sulfur heavy fuel oil product; and

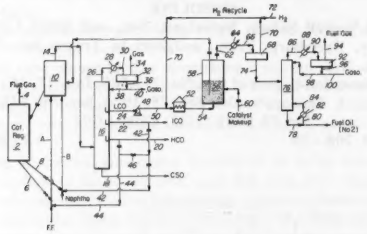
d. hydrocracking the gas-oil fraction in a second hydrocracking zone with molecular hydrogen at a temperature in the range of about 700°F. to about 780°F., in the presence of a sulfur and nitrogen resistant hydrocracking catalyst to produce gasoline boiling in the range of 55°–430°F. and containing 100 ppm or less sulfur and nitrogen.

3,891,540

COMBINATION OPERATION TO MAXIMIZE FUEL OIL PRODUCT OF LOW POUR

Edward J. Demmel, Pitman; Donald M. Nace, Woodbury; Hartley Owen, Belle Mead, and Edward J. Rosinski, Deptford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 2, 1974, Ser. No. 457,310
Int. Cl. C10g *37/06;* **C01b** *33/28*
U.S. Cl. 208—77 **16 Claims**



1. A method for improving the yield of low pour light fuel oil product which comprises,

catalytically cracking a mixture comprising fresh gas oil feed and heavy cycle oil product of cracking in a first conversion zone under conditions selected to restrict conversion to less than 45 volume percent,

separating the product of said first conversion zone to recover gasoline and lower boiling components from a light fuel oil fraction, an intermediate cycle oil fraction and a heavy cycle oil fraction, recycling the heavy cycle oil fraction to said first conversion zone,

passing the intermediate cycle oil fraction to a second conversion zone and restricting catalytic conversion thereof to increase the yield of desired light fuel oil,

separating the product of the intermediate cycle oil conversion operation to recover gasoline and lower boiling components from light fuel oil and higher boiling cycle oil and

reducing the pour point of the light fuel oil fraction of the combination catalytic cracking operation by contacting it with a ZSM-5 type crystalline zeolite under hydrodewaxing conditions.

3,891,541

PROCESS FOR DEMETALIZING AND DESULFURIZING RESIDUAL OIL WITH HYDROGEN AND ALUMINA-SUPPORTED CATALYST

Stephen M. Oleck, Moorestown; Thomas R. Stein, Cherry Hill; Howard S. Sherry, Cherry Hill, and Donald Milstein, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 29, 1973, Ser. No. 392,708
Int. Cl. C10g *23/02*
U.S. Cl. 208—89 **7 Claims**

1. A process for catalytically demetalizing and desulfurizing a residual oil comprising contacting said oil with hydrogen under the following hydroprocessing conditions: a hydrogen pressure of about 500 to 3000 psig, a hydrogen circulation rate of about 1000 to 15,000 scf/bbl of feed, a temperature of about 600° to 850°F, a space velocity of 0.1 to 5.0 LHSV, in the presence of a catalyst comprising the oxides or sulfides of a Group VIB metal and an iron group metal on an alumina support, said catalyst having not less than about 55 to 75% of its pore volume in pores having a diameter range of about 180A to about 300A, and having a surface area in the range of 40 to 70 m^2/g.

3,891,542

METHOD FOR INSURING HIGH SILICON CARBIDE CONTENT IN ELNISIL COATINGS

Leonard G. Cordone, Allen Park; William A. Donakowski; John R. Morgan, both of Dearborn Heights, and Karl Roemming, Detroit, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 5, 1973, Ser. No. 413,155
Int. Cl.[2] C25D *5/02, 3/12*
U.S. Cl. 204—16 **5 Claims**

1. A method for electrolytically depositing a highly uniform wear-resistant dispersion coating onto a cast substrate, comprising:

a. providing an aqueous acidic solution containing at least one nickel salt selected from the group consisting of nickel sulfate, nickel chloride, nickel fluoroborate, and nickel sulfamate and any mixtures thereof, said salt being present in a concentration of at least 600 grams/liter, said solution containing also a suspension of inert wear-resistant particles in a concentration of about 150 grams/liter and a predominant particle size no greater than 3 microns and having a shape which is spherical or acicular so as to disperse quickly through said solution, said solution being maintained at a temperature no less than 160°F,

b. introducing an inert gaseous medium into said solution at a plurality of stations disposed uniformly throughout a bottom horizontal zone of said solution and at a flow rate of between 75–125 c.c./minute/cm^2 to turbulate said solution in a manner for preventing laminar conditions in said solution, and

c. applying an electrical potential between a nickel containing anode assembly and said cast substrate to provide a current density at said cast substrate of about 400 amps/ft^2.

3,891,543
CENTRIFUGAL SIFTER APPARATUS

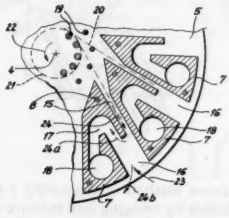
Josef Wessel, Am Sonnenhof 154, 8131 Aufkirchen, Germany

Continuation of Ser. No. 256,415, May 24, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,744

Claims priority, application Germany, Feb. 3, 1971, 2104967

Int. Cl. B07b *7/83*

U.S. Cl. 209—144 **21 Claims**



1. Centrifugal sifter apparatus comprising a housing having an air inlet for sifting air and outlets for coarse and fine materials, respectively; a rotor mounted within said housing for rotation about an axis; means for introducing material to be sifted to said rotor at an inlet zone in the vicinity of said axis; and means establishing a plurality of circumferentially spaced material distributing passages in said rotor and extending outwardly from said inlet zone to a sifting zone and a plurality of circumferentially spaced fine material discharge passages alternating with said distributing passages and extending inwardly from said sifting zone toward but terminating short of said inlet zone, each of said distributing passages having a fine material discharge opening therein extending axially of said rotor, each of said discharge openings occupying a position closer to the rotor's periphery than to its axis of rotation.

3,891,544
PROCESS FOR THE SEPARATE RECOVERY OF POTASSIUM CHLORIDE AND SODIUM CHLORIDE FROM A SOLID MIXTURE THEREOF

Alan M. Becker; Joseph A. Epstein; Michael S. Lupin, and Shaul Zolotov, all of Beer-Sheba, Israel, assignors to Dead Sea Works Ltd., Beer-Sheba, Israel

Filed July 11, 1973, Ser. No. 378,309

Claims priority, application Israel, July 28, 1972, 40016

Int. Cl. B03d *1/02*

U.S. Cl. 209—166 **4 Claims**

1. A method for the separate recovery of potassium chloride and sodium chloride from a solid mixture thereof, comprising preparing an aqueous slurry of said solid mixture embodying at least one sodium chloride crystal habit modifier, selected from the group consisting of sodium ferrocyanide, potassium ferrocyanide, sodium ferricyanide, potassium ferricyanide, manganese chloride, citric acid, sodium citrate, nitrilotriacetamide hydrochloride, nitrilo-triacetamide hydrosulfate, 3,5-dioxo-1-piperazine acetamide, nitrilo-diacetamide monoacetic acid, nitrilo-diacetamide monoacetonitrile, monosodium glutamate, methyl cellulose, gum arabic agitating said slurry and allowing said modifier to act on the sodium chloride for at least five minutes, adding flotation reagents to the slurry, inducing a froth flotation separation to occur, and recovering a potassium enriched fraction from the top and a sodium chloride enriched fraction from the bottom.

3,891,545
IMINOPHENOLS AS FROTH FLOTATION REAGENTS FOR METALLIC ORES

Vojislav Petrovich, 1929 W. Schiller St., Chicago, Ill.

Filed Apr. 30, 1974, Ser. No. 465,412

Int. Cl.^{2} B03D *1/02*

U.S. Cl. 209—166 **3 Claims**

1. A method of beneficiating ores selected from the groups consisting of oxide of iron, oxide, silicate, and sulfide of copper, oxide, silicate, sulfide, arsenide, and antimonide of nickel, oxide, sulfide, arsenide, and antimonide of cobalt, the vanadate of heavy metals by froth flotation process to produce a froth concentrate of desired metal values which comprises effecting the froth flotation of the said ores and minerals in the presence of methyliminodihydroxybenzoic acid as collector in a pulp of mineral slurry having a pH of 8 to 12; and recovering the desired metal value in an enriched froth concentrate, leaving a tailings poor in the desired metal value.

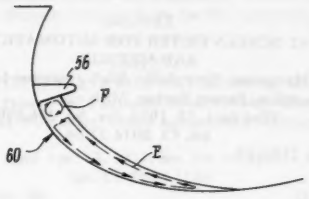
3,891,546
HELICAL CHUTE CONCENTRATOR AND METHOD OF CONCENTRATING

Ira B. Humphreys, 910 American National Bank Bldg., Denver, Colo. 81802

Filed Sept. 8, 1971, Ser. No. 178,638

Int. Cl. B03b *3/04*

U.S. Cl. 209—211 **4 Claims**



1. An apparatus for concentrating and separately collecting from a mass of intermixed particles of different specific gravities those particles having like specific gravity comprising, a stationary downwardly inclined helical chute, means for feeding an intermixture of liquid and particles of said mass as a stream to the upper end of said chute, said chute having an inner low concave side wall terminating only a little beyond the lowermost point of the chute bottom and an outer side wall defined by an upstanding abutment projecting at approximately 90° from the chute bottom, and the bottom of the chute in spaced relationship lengthwise thereof and in substantially the said lowest portion thereof being provided with outlet openings for the discharge of a portion of said stream and the particles therein.

3,891,547
PERMEABLE HOLLOW FIBER FILTER

Daniel P. Y. Chang, Davis; Sheldon K. Friedlander, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 296,097, Oct. 10, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,795

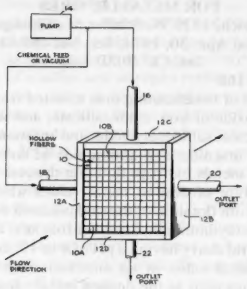
Int. Cl. B01d *13/00*

U.S. Cl. 210—23 **4 Claims**

1. A method of improving the particulate matter collection efficiency of a hollow fiber mesh filter comprising

flowing a carrier solution containing particulate matter to be collected between the fibers of said hollow fiber mesh

filter, said fibers being substantially nonpermeable to said particulate matter and being constructed and arranged to permit the passage of the carrier fluid therebetween while intercepting the particulate matter,



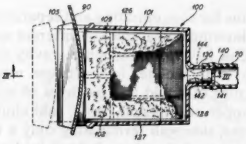
modifying the outer wall surface of said hollow fibers and the region immediately therearound to increase the efficiency of particulate matter collection by passing a fluid through said hollow fibers to which said hollow fiber walls are slightly pervious, where said fluid is one of the group consisting of a solution of an electrolyte, a solution of a polyelectrolyte, and water.

3,891,548

MANUAL SCREEN FILTER FOR AUTOMATIC WASHER AND METHOD

Henry Marcussen, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 13, 1973, Ser. No. 396,890
Int. Cl. B01d *37/04*
U.S. Cl. 210—65 **12 Claims**



1. A method of filtering suspended lint from a flow of laundry liquid in an automatic washer which comprises the steps of circulating laundry liquid in the form of a stream through a recirculating circuit, directing liquid in the stream through a filter to separate particles from said flow by said filter, said filter having an inclined surface with a storage area adjacent thereto, retaining the separated particles on the inclined surface of said filter, at one point in the circuit changing a pressure head in the stream to a velocity head, directing the flow at increased velocity against said inclined surface of the filter and moving said separated particles imparted by said flow off of the said surface to the storage area of said filter, and retaining the particles in the storage area.

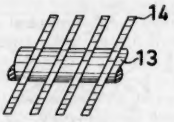
7. A filter assembly comprising: a housing having an inlet, nozzle means disposed at the inlet for directing a flow of fluid through the housing, and a removable filter element disposed in the housing, said filter element having a contour to provide a first portion and second portion, said first portion being received in the housing adjacent the inlet at a shallow angle to the direction of flow of fluid from the nozzle to provide a primary filtering area, said second portion having a U shape with legs with a portion of the first portion extending between said legs, said second portion extending from the first portion to a level in the housing below the level of an adjacent portion of the first portion to provide a storage area spaced from the inlet for receiving particles separated by the primary filtering area and moved by the flow of fluid therefrom.

3,891,549

METHOD AND AN APPARATUS FOR DEWATERING A SUSPENSION

Amichai Meir Carmel, Nynashamn, and Bengt Olov Lundh, Hedemora, both of Sweden, assignors to Rederiaktiebolaget Nordstjernan, Stockholm, Sweden

Filed Apr. 9, 1973, Ser. No. 349,360
Claims priority, application Sweden, Apr. 13, 1972, 4778/72
Int. Cl. B01d *37/04*
U.S. Cl. 210—66 **4 Claims**



1. In the known method of separating a mixture of liquid and solid materials by bringing said mixture into contact with a moving filtering means of the endless belt type which permits passage of the liquid but which denies passage to the solids, with the result that due to the compressibility of said mixture a substantially impermeable layer of solids is built upon the filtering means, the improvement which comprises increasing the permeability of said impermeable layer of solids which has built up on the filtering means by:

a. the application of a plurality of spaced disk means, inclined from the vertical and constructed and arranged to create layer-disrupting rotating forces at spaced apart points across the width of said filtering means, each of said rotating disk means penetrating said layer to a point immediately adjacent to the surface of the filtering means in such a manner that the combined action of the rotating disks will be to raise at least some of said impermeable layer laterally up to and above said impermeable layer and in so doing form a plurality of essentially parallel ditches and ridges extending longitudinally with respect to the direction of movement of the moving filtering means, and

b. thereafter subjecting said layer with its plurality of longitudinally extending ditches and ridges to a surface leveling means which is constructed and arranged to move the top of each ridge laterally into adjacent ditches and so that the ditches will be eliminated and a layer of substantially uniform thickness produced, thereby increasing the permeability of said layer.

3,891,550

PROCESS AND APPARATUS FOR RECOVERING BITUMEN FROM BITUMINOUS SANDS

Frank Alexander Gray, and John Adam Gray, both of 169 Fifth St., Toronto, Ontario, Canada (M8V 2Z7)

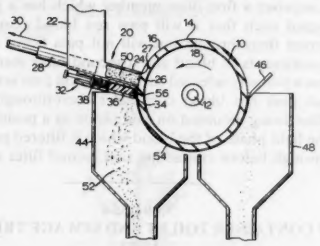
Continuation of Ser. No. 194,304, Nov. 1, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,085
Int. Cl. B01d *33/02*
U.S. Cl. 210—67 **20 Claims**

1. In a process for recovering bitumen from an admixture of bitumen, sand and water derived from a bituminous sand deposit of the type described, the steps of

a. compacting a mass of the admixture,
b. directing the compacted mass against an oleophilic surface displaceable generally transversely to the direction of application of the mass,
c. constraining the mass against the surface in the region of application only to apply a thin layer of the mass thereonto,
d. driving the surface at a rate of displacement sufficient to and in a direction to apply the layer and to dislodge sand from the applied layer of the admixture following release from constraint and
e. recovering the residue adhered to the surface.

9. In apparatus for separating sand from an admixture of oil or bitumen sand and water derived from a bituminous sand deposit of the type described and recovering an oil or bitumen enriched residue therefrom, the combination of

a. means presenting a smooth endless oleophilic surface of substantial width;



b. means for delivering a mass of admixture against a selected region of said surface, including a charging apparatus terminating in a discharge orifice;
c. means for supporting said discharge orifice in closely spaced relation to said surface in the region of application of the mass to said surface, thereby defining a restricted passageway to constrain the mass to be applied thereonto to a thin layer of substantially uniform thickness;
d. means associated with said charging apparatus for displacing the mass therewithin to said surface through said discharge orifice;
e. means for continuously displacing said surface at a rate sufficient and in a direction to constrain the mass and apply the thin layer and to dislodge sand from the applied layer respectively after emerging from said restricted passageway; and
f. means for removing the adhered residue of the mass from said surface.

3,891,551

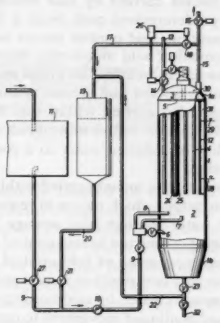
METHOD OF CLEANING A LIQUID FILTER, AND FILTER FOR PERFORMING THE METHOD

Wolfgang Otto Tiedemann, Sigtuna, Sweden, assignor to Sibtec, AB, Stockholm, Sweden

Filed Sept. 14, 1973, Ser. No. 397,304
Int. Cl. B01d *23/24*
U.S. Cl. 210—82 **12 Claims**

1. In a method of filtering solids from a liquid suspension thereof wherein the suspension flows under pressure into an inlet zone, then from said inlet zone through filter elements into an outlet zone causing said solids to be deposited on said filter elements while a filtrate passes into said outlet zone, then permitting said filtrate to flow from said outlet zone, the method of cleaning said filter elements to remove deposited solids which comprises:

a. providing an air pocket confined in said inlet zone;
b. stopping filtration by simultaneously stopping the flow of suspension to the inlet zone and the flow of filtrate from the outlet zone;
c. briefly admitting compressed air under high pressure into the outlet zone to cause a momentary, intense reversal of flow of liquid through the filter element into the inlet zone, thereby simultaneously dislodging deposited solids from said filter elements, increasing the pressure of liquid in the inlet zone, and compressing the air in the aforementioned air pocket; and



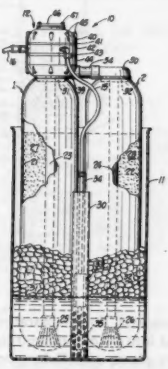
d. immediately thereafter rapidly releasing the pressure in the outlet zone to cause the compressed air in said air pocket to expand to its initial volume and cause a momentary, intense flow of liquid through the filter elements from the inlet zone to the outlet zone, thereby breaking up the deposits removed from the filter elements.

3,891,552

CONTROL VALVE FOR WATER SOFTENERS

William C. Prior, 9482 Fairmount Blvd., Novelty, Ohio 44072, and James W. Kewley, 13681 Auburn Rd., Newbury, Ohio 44065

Filed Apr. 12, 1974, Ser. No. 460,292
Int. Cl. B01d *15/04*
U.S. Cl. 210—88 **21 Claims**



1. A control device for use in a water conditioning apparatus of the type including a pair of ion-exchange water softener tanks connectable with a source of pressurized water and with a water system to supply softened water to the water system, the tanks each being capable of regeneration by flushing with a regeneration solution to replenish depleted ions, comprising:

a. a housing adapted for connection to the softener tanks, to

the source of pressurized water, to the water system, and to a source of regeneration solution;

b. water usage monitoring means carried by said housing for monitoring the flow of softened water supplied to the water system and including an output which moves in response to the supply of softened water to the water system;

c. control means carried by said housing for movement along a predetermined path from a first position to a second position, said control means being responsive to the movement of said monitoring means output through a first movement to effect an initial movement from said first position toward said second position;

d. a control valve carried within said housing and being responsive to said initial movement to provide a controlled flow of softened water to a passage formed with said housing;

e. regeneration drive means carried within said housing and having an output which moves in response to the flow of softened water through said passage, said drive means output being connected to said control means to continue the driven movement of said control means along said path from said first position to said second position; and

f. valve means carried by said housing and being responsive to said continued movement to connect a first one of the softener tanks on-line with the source of pressurized water and the water system, and to take the second softener tank off-line and effect its regeneration by flushing said second softener tank with regeneration solution.

3,891,553

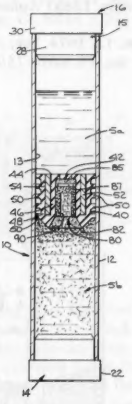
SERUM AND PLASMA SEPARATOR — CONSTRICTIONLESS TYPE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,363

Int. Cl. B01d *21/26*

U.S. Cl. 210—136 **3 Claims**



1. A self-contained fluid separator assembly capable of separating blood into its component light phase of plasma or serum and heavy phase or cellular portion comprising:

a. a container having a first open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase and a second open end for removing the separated light phase;

b. closures sealing the open ends of the container, the closures being formed of a self sealing elastomeric material which is penetrable by a cannula;

c. a piston having a specific gravity relatively greater than the cellular portion of the blood and slidably mounted in the container and having means on an outer surface for providing sealing engagement with an inner surface of the container;

d. pressure responsive valve means associated with said piston, said valve means being constructed and arranged to be normally closed when there is a minimum of pressure differential on opposite sides of the valve means and which automatically opens in response to a substantial pressure differential so that when said container is subjected to moderate centrifugal force the blood separates into its light phase and heavy phase but the piston stays in the upper portion of the container, and subsequently when increased centrifugal force is used the valve means automatically opens with the light phase passing up through the valve means enabling the piston to move down through the light phase while retaining sealing engagement with the inner surfaces of the container; and

e. filter and stop means associated with said piston which comprises a first filter member which has a porosity selected such that it will pass red blood corpuscles and serum therethrough but will not pass fibrin and fibrous constituents of blood and a second filter member which has a porosity selected such that it will pass serum but will not pass red blood corpuscles therethrough; said first filter being mounted on said piston in a position wherein the light phase of the blood which is filtered passes therethrough before contacting said second filter member.

3,891,554

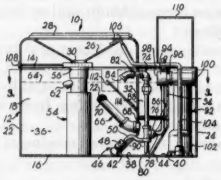
SELF CONTAINER TOILET AND SEWAGE TREATMENT UNIT

Carlos M. Cooper, Lake Forest, Bonner Springs, Kans. 66012, and Francis M. Gladson, Jr., 2432 South 63rd Ter., Kansas City, Kans. 66104

Filed Mar. 12, 1974, Ser. No. 450,303

Int. Cl.² B01D *35/02*

U.S. Cl. 210—152 **18 Claims**



1. A self-contained toilet and sewage treatment unit comprised of:

a container adapted for receiving sewage and having a supply of water therein,

said container having a first sewage-receiving compartment containing a portion of said water with which the sewage mixes;

means operable coupled with a source of pressurized air for introducing and normally continuously circulating a supply of air through the sewage and water mixture in said first compartment whereby the compartment defines an aeration chamber,

said air introduction and circulation means including air discharge structure arranged in said compartment to direct and circulate air through the mixture such that the same is agitated with the sewage therein being in substantially complete suspension in the water at all times;

a second compartment within said container in flow communication with said first compartment and defining a settling chamber for clarifying the sewage and water mixture therein;

filtration means located within said container and in flow communication with said second compartment for receiving and removing from the clarified water substantially all sewage particles remaining therein;

a third compartment within said container in flow communication with said filtration means for receiving the filtrate therefrom and defining a holding chamber for the filtered water; and

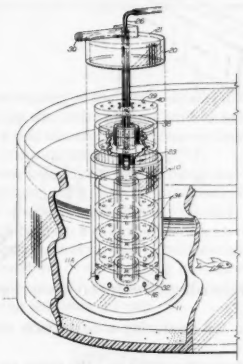
recycling means disposed within said container and adapted for returning the filtered water from said third compartment to said first compartment on demand.

3,891,555

AQUARIUM FILTER WITH REPLACEABLE CARTRIDGE

John P. Bennett, Portola Valley; George D. Bliss, Palo Alto, both of Calif., and Michael New, Marlow, England, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Feb. 4, 1974, Ser. No. 439,094
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **7 Claims**



1. A filter device adapted to be introduced into the liquid in an aquarium and the like and positioned in said aquarium for the purification and aeration of the aquarium liquid, comprising, in combination:

a. an elongated tubular container member, said container member having an outer wall and an inner wall concentric therewith and defining an annulus, both walls being integral with a bottom wall and extending upward therefrom about the same distance and at least one annular filter cartridge in said annulus, the lower portion of said outer wall of said container member being provided with a plurality of openings to admit aquarium liquid therethrough and the interior of said inner wall defining a sump for receiving filtered liquid;

b. a hollow cap or closure member of the same configuration as said container, and means for attaching or removing said cap to or from said container located at the upper end of said container;

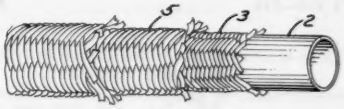
c. said cap or closure member having integrally connected thereto in its central portion a downwardly extending tubular member which is open at its lower end and which extends to near the bottom of said sump, thus providing means for collecting and discharging filtered aquarium liquid, and air inlet conduit means coaxially positioned in the interior of said liquid discharge means and extending to near the bottom of said discharge means.

3,891,556

MULTI-LAYER BRAIDED TUBULAR MEMBRANE REINFORCEMENT

John L. Richardson; Alexander O. Brodie, both of Orange, and Clarke H. Lewis, Fountain Valley, all of Calif., assignors to Oxy Metal Industries (Intra) Inc., Lyndhurst, N.J.

Filed Nov. 15, 1971, Ser. No. 198,612
Int. Cl. B01d *31/00*
U.S. Cl. 210—490 **2 Claims**



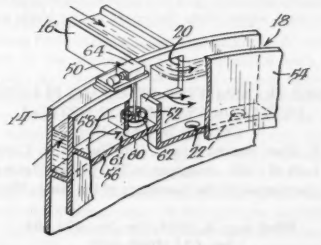
1. A tubular assembly adapted for use in ultrafiltration or reverse osmosis systems comprising a thin and mechanically fragile semipermeable tubular membrane surrounded only by a reinforcing fibrous braided structure to enable the semipermeable membrane to withstand high internal hydraulic pressures, said reinforcing fibrous braided structure including at least one layer of braided fiber supporting the semipermeable membrane, said fibers of said one layer being arranged at a locking angle with the axis of the tubular membrane when said membrane is under said high internal hydraulic pressure such that the said one layer makes the tubular assembly dimensionally stable in both axial and radial directions under said hydraulic pressure but which permits said assembly to be bent around comparatively small radius while pressurized at a pressure lower than said high internal hydraulic pressure without localized loss of support of the semi-permeable membrane and further including between said one layer of braided fiber and said semipermeable membrane an initial braided fibrous layer having a lower denier than the denier of the fiber of said one layer, said lower denier fiber being braided at an angle greater than the locking angle to obtain a higher density of braided material adjacent the semipermeable membrane to act as a support therefore at times when said internal pressure within the membrane is lower than said high internal pressure.

3,891,557

PERIPHERAL FEED CLARIFICATION TANK

Philip Edgerton, Holicong, Pa., assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 11, 1974, Ser. No. 441,456
Int. Cl. B01d *21/00*
U.S. Cl. 210—519 **7 Claims**



1. In a clarification tank having effluent means located therein for receiving clarified liquid, influent means for supplying a mixed liquor including a liquid having suspended solids therein, said influent means including an elongated channel within said tank and inlet means to said channel for supplying mixed liquor to the channel, said channel having side walls and a bottom wall, one of said walls having openings therein in communication with said tank to supply mixed liquor to said tank, and a pump means within said channel

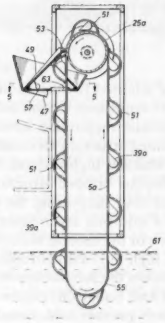
spaced from said inlet means for increasing the velocity of said mixed liquor in said channel to a point which is greater than the velocity of said mixed liquor through said inlet means.

3,891,558

OIL AND DEBRIS REMOVAL UNIT

Paul Condit, Jr., 11327 Sage Park, Houston, Tex. 77034

Filed Dec. 6, 1972, Ser. No. 312,605
Int. Cl. B01d *43/00*
U.S. Cl. 210—526 **8 Claims**



1. In an endless belt conveyor apparatus for removing polluting fluids and debris from a body of water comprising:
a rotatable shaft position above a body of water for supporting thereon said endless belt conveyor,
an endless belt disposed on said shaft and extending by gravity only and freely downwardly into contact with said body of water,
drive means operatively associated with said rotatable shaft for mobilizing said endless belt so as to bring successive areas of the belt into contact with the polluted water and a wiper blade positioned in intimate contact with the exterior surface of the belt so as to remove polluting fluids therefrom,
said endless belt being characterized by flight means affixed to the exterior surface thereof for collecting and transporting debris from the water and toward a receptacle area, and
track means affixed to said belt adjacent each said flights for lifting said wiper blade thereover as the blade passes by.

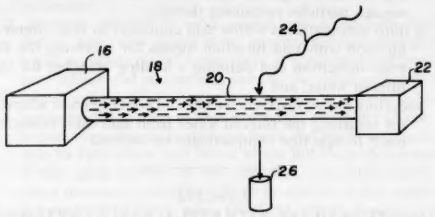
3,891,559

DYE LASER TRANSMITTER-RESONANT FLUORESCENT DETECTOR SYSTEM FOR OPTICAL COMMUNICATIONS

Howard E. Rast, Solana Beach, and Hubert H. Caspers, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1974, Ser. No. 494,102
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **3 Claims**

1. In an optical communication system the combination comprising:
a. an optical transmitter for transmitting an electrooptically modulated CW laser beam at a predetermined frequency;
b. filter means for intercepting the optically transmitted signal, said filter means including a molecular beam intersecting said incoming signal for absorbing and re-emitting energy at the frequency of said transmitted beam, said filter means being variable from a high pass filter to a low pass filter by changing the angle of incidence between said molecular beam and said intercepted signal;



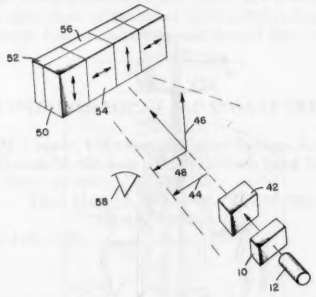
c. detecting means positioned to intercept said re-emitted energy for detecting said incoming signal.

3,891,560

LARGE SCREEN COLOR DISPLAY

Arthur N. Chester, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 28, 1974, Ser. No. 437,421
Int. Cl.[2] G01N *21/38*
U.S. Cl. 250—461 **9 Claims**



1. A large screen color laser display comprising:
a screen;
a light source for producing a beam with specific wavelength;
a deflection means for deflecting the beam on said screen;
said screen comprising:
a polarizing layer comprising a plurality of small first areas polarized in a first direction and a plurality of small second areas polarized in a second direction;
said layer consisting of a solid substrate material to which an optical coating is applied;
a scattering coating beneath said first polarizing areas for scattering selected colors; and
a phosphor beneath said second polarizing areas for producing a color of other than said wavelength of said light source.

3,891,561

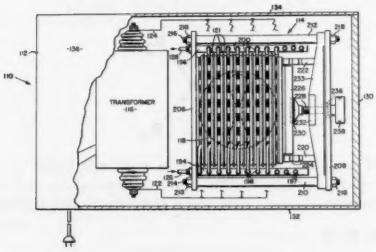
CORONA GENERATOR APPARATUS

Frank E. Lowther, Phelps, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

Division of Ser. No. 141,148, May 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 709,485, Feb. 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 612,751, Jan. 4, 1967, abandoned, said Ser. No. 830,248. This application Sept. 7, 1973, Ser. No. 395,180. The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed
Int. Cl. C01b *13/12*
U.S. Cl. 250—541 **8 Claims**

1. An ozone generator comprising:
a. a corona generating core including a plurality of separate, individual corona generating cells;
b. each of said corona generating cells comprising:

1. a pair of adjacent, spaced-apart, electrodes;
2. a continuous, air-tight dielectric spacer gasket of corona and ozone resistant material, positioned between and in contact with the internal facing surface of each electrode of said pair of electrodes of each cell around the entire periphery of each of said electrodes, for defining a corona generating chamber between said internal facing surfaces of said electrodes and interiorly of said gasket;
3. means for feeding an oxygen-containing gas into and ozone out of said chamber;
4. means for sealing said chamber air-tight and for maintaining said chamber air-tight;



5. a fired-on coating of porcelain enamel dielectric material covering the entire internal surface in said chamber of each of said electrodes said coating being fired on at a temperature greater than 1,000° F;

c. spacer means positioned between adjacent cells in said core for spacing said cells a predetermined distance apart, said spacer means having cooling passageways therethrough, and each of said electrodes having substantially all of its external surface in heat-exchange relationship to at least one of said cooling passageways; and

d. the total thickness of both coatings of dielectric material together being less than 20 mils.

3,891,562

ARRANGEMENT IN A REACTOR FOR PLASMA-CHEMICAL PROCESSES

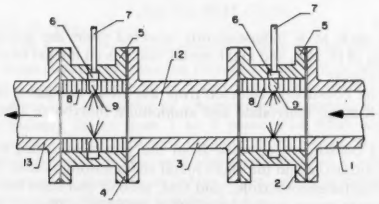
Palne Mogensen, Jarfala, and Mats J. Kaij, Solna, both of Sweden, assignors to AGA Aktiebolag, Sweden

Filed Oct. 9, 1973, Ser. No. 404,657

Claims priority, application Sweden, Oct. 13, 1972, 13196/72

Int. Cl. C22d *7/08*; **C07c** *3/24*

U.S. Cl. 250—547 **4 Claims**



1. In a reactor for a plasma-chemical process, said reactor including an arc-chamber containing electrodes for the transmission of an arc therethrough, and means for supplying a plasma gas stream through said arc, the improvement which comprises a plurality of reactors provided downstream from said arc chamber for the receipt of said plasma gas stream, and a plurality of means for imparting alternating clockwise and counterclockwise tangential velocity components to said plasma gas stream passing therethrough.

2. The reactor of claim **1** including a plurality of cooling chambers provided downstream from said arc chamber, and alternating with said plurality of reactors, and wherein said means for imparting alternating clockwise-and counter-clockwise tangential velocity components to said plasma gas stream are associated with said alternating reactors and cooling chambers, respectively.

3,891,563

SOFTERGENT COMPOSITION CONTAINING N-ALKYL-,3-PROPYLENE DIAMINE

Adolph Renold, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 287,834

Int. Cl. D06m *13/34*

U.S. Cl. 252—8.8 **11 Claims**

1. A softergent composition comprising the reaction product of an N-higher alkyl-1,3-propylene diamine and maleic anhydride, said N-higher alkyl group having from 12 to 22 carbon atoms, and a detergent, said detergent selected from the group consisting of nonionic non-soap, anionic, cationic, and amphoteric detergents, and soap and mixtures thereof.

3,891,564

PROCESS FOR PREPARING MIXED LITHIUM-CALCIUM SOAP THICKENED GREASES

Don A. Carley, Nederland, and Fred T. Crookshank, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 226,304

Int. Cl. C10m *5/16*, *5/14*, *5/12*

U.S. Cl. 252—40 **5 Claims**

1. A nonmelt process for preparing mineral oil-based greases combining good lubrication properties, good resistance to water and a smooth nongrainy appearance, said greases being thickened by a mixture of calcium soaps and lithium soaps, formed in situ through the saponification of a saponifiable fatty material with a mixture of calcium hydroxide and lithium hydroxide with the provisos

a. that during the in situ saponification step between the fatty materials and the calcium and lithium hydroxide materials said saponification always takes place in the presence of excess mineral oil of lubricating viscosity, the excess of oil to fat not to exceed a ratio of 2:1 to 4:1 and b. that during said saponification step and throughout the entire preparative process the saponification temperature shall not exceed the melting point of the calcium and lithium soaps formed during the saponification process, said non-melt process consisting essentially of:

1. admixing from about 4.5 parts by weight to 20 parts by weight of the saponifiable fatty material with from about 0.1 to 1.6 parts by weight of calcium hydroxide and from about 0.1 to 1.3 parts by weight of basic lithium hydroxide materials in the presence of sufficient mineral oil to maintain the ratio of said mineral oil to said fatty materials ranging from 2:1 to 4:1, and to form a saponification mixture;
2. heating said saponification mixture up to but not exceeding the melting point of the calcium and lithium soap until the calcium and lithium soap are formed;
3. adding from 5.0 to 0.1 parts by weight of a copolymer of polyoxyethylene and poly-1,2-oxypropylene having a molecular weight of from about 2300 to 2500 to said heated saponification mixture, and
4. adding to the heated mixture of mineral oil, calcium and lithium soaps from 7.0 to 0.5 parts by weight of grease adjuvants while maintaining the temperature of the saponification mixture below the melting point of said lithium and calcium soap while optionally adding sufficient mineral oil to said saponification mixture

until a grease of the desired consistency having good lubrication properties, good resistance to water and good appearance is produced.

3,891,565

GRAVEL PACKING FLUID

Patrick J. Colpoys, Houston, Tex., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 17, 1973, Ser. No. 324,374
Int. Cl. E21b *33/12*
U.S. Cl. 252—8.55 R **5 Claims**

1. A gravel packing fluid consisting essentially of a base liquid, (a solid particle weighting agent) iron oxide suspended in said base liquid and chrysotile asbestos fibers incorporated therein such that enough (weighting agent) iron oxide can be suspended in said base liquid to provide a packing fluid having a density greater than 11.8 ppg, said chrysotile asbestos fibers incorporated in said iron oxide having a solubility of at least about 90 weight percent in hydrochloric acid.

3,891,566

FLUID LOSS ADDITIVE

Curtis W. Crowe, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 249,085, is a continuation-in-part of Ser. No. 177,680, Sept. 3, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,214
Int. Cl. E21b *43/25*
U.S. Cl. 252—8.55 R **1 Claim**

1. A low fluid loss additive dispersible in aqueous fluids employed for treating subterranean formations comprising:

a. a liquid mono or polyhydric alcohol and a heterogeneous mixture of discrete particles consisting essentially of;

b. a particulate oil soluble pliable resin ranging in size from about 0.05 to about 30 microns dispersed in said alcohol; and

c. a particulate oil soluble friable resin ranging in size from about 0.5 to about 300 microns dispersed in said alcohol, said friable and pliable particles being present in a weight ratio to each other ranging from about 1:20 to 20:1 and said composition being essentially free of an oil in which said particles are soluble.

3,891,567

CARBOXY VINYL POLYMER AND PARTIALLY HYDROLYZED POLYACRYLAMIDE MOBILITY CONTROL AGENT AND PROCESS

Charles J. Norton, and David O. Falk, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Division of Ser. No. 238,143, March 27, 1972, Pat. No. 3,825,069. This application Oct. 23, 1973, Ser. No. 408,711
Int. Cl. E21b *43/22, 43/16*
U.S. Cl. 252—8.55 D **10 Claims**

1. Compositions comprising aqueous solutions of about 0.001% to about 10% of partially hydrolyzed polyacrylamide and about 0.001% to about 10% of carboxy vinyl polymers, the percents based on total weight of the solution.

3,891,568

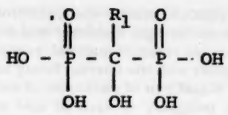
METHOD AND COMPOSITION FOR CONTROL OF CORROSION AND SCALE FORMATION IN WATER SYSTEMS

Kazuo Nishio, Chicago, and Paul G. Bird, Wheaton, both of Ill., assignors to Wright Chemical Corporation, Chicago, Ill.

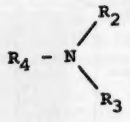
Filed Aug. 25, 1972, Ser. No. 283,937
Int. Cl.[2] **C02B** *5/00;* **C23F** *11/08*
U.S. Cl. 252—181 **14 Claims**

1. A method for controlling corrosion and scale deposition in an aqueous system, comprising adding to said system:

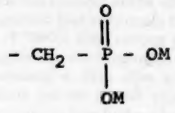
A first constituent selected from the class consisting of (a) compounds having the general formula



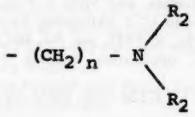
wherein R_1 is alkyl having from 1 to 5 carbon atoms, and alkali metal and ammonium salts of said compounds, and (b) compounds having the general formula



wherein R_2 is



R_3 is selected from the class consisting of R_2 and $—CH_2C-H_2OH$, and R_4 is selected from the group consisting of R_2, $—CH_2CH_2OH$, and



wherein each M is independently selected from the group consisting of H, NH_4 and alkali metal, and n is an integer from 1 to 3 inclusive;

a second constituent selected from the group consisting of alkali metal molybdate and ammonium molybdate salts; and

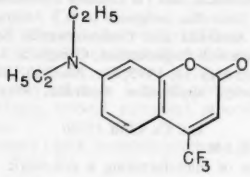
a third constituent selected from the group consisting of benzotriazole and the alkali metal and ammonium salts of mercaptobenzothiazole, said first, second and third constituents being added in relative amounts sufficient to provide said aqueous system with a concentration of said first constituent of at least 0.8 ppm, a concentration of said second constituent of at least 7 ppm, and a concentration of said third constituent of at least 1 ppm if said third constituent is benzotriazole and of at least 2 ppm if said third constituent is a mercaptobenzothiazole salt.

3,891,569

LASING DYES

Erhard J. Schimitschek, San Diego; John A. Trias, LaMesa, and John E. Celto, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 11, 1974, Ser. No. 441,720
Int. Cl.[2] C09K *11/00*; H01S *3/00*
U.S. Cl. 252—301.2 R 5 Claims



1. A liquid dye laser composition comprising a 7-amino coumarin compound having a trifluoromethyl group in the 4-position and dissolved in a low polar, non-quenching liquid solvent.

3,891,570

PROCESS FOR PREPARING MICROCAPSULES

Mitsuru Fukushima; Yoshihito Inaba; Sadami Kobari, and Masataka Morishita, all of Shizuoka, Japan, assignors to Toyo Jozo Co., Ltd. and Fuji Photo Film Co., Ltd., Japan

Filed Jan. 26, 1973, Ser. No. 326,844
Claims priority, application Japan, Jan. 26, 1972, 47-10068
Int. Cl. B01j *13/02*; B44d *1/02*
U.S. Cl. 252—316 17 Claims

1. A process for preparing microcapsules, which comprises preparing a dispersion or a solution of a core substance in a solution of a wall material dissolved in a solvent having a dielectric constant of about 10 or less, emulsifying the thus prepared dispersion or solution in the form of fine droplets within a liquid vehicle consisting essentially of a polyhydric alcohol which is poorly miscible with said solvent and evaporating the solvent from solution through said vehicle.

3,891,571

FOAM PRODUCING COMPOSITION CONTAINING WHEY SOLIDS

Madeline G. Lambou; James J. Spadaro, both of New Orleans, and Eunice M. Rusch, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 26, 1973, Ser. No. 410,052
Int. Cl. B01f *17/30*
U.S. Cl. 252—354 7 Claims

1. A foam precursor composition that can be generated to a foam capable of retaining its configuration at or below 36°F for a period of time up to about 8 days, said foam precursor composition consisting of a homogenous suspension of water containing about from 1 to 2 percent of whey solids, the protein content of which is about from 7.5 to 51 percent; about from 0.5 to 1 percent of animal hide glue, a collagenous component; about from 0.3 to 2 percent of a surfactant selected from the group consisting of:

an anionic ammonium lauryl trioxyethylene sulfate, and

an ammonium substituted C_{12} to C_{18} alkyl sulfate; and about from 0.1 to 0.3 percent of a viscosity builder selected from the group of water dispersible polymers consisting of:

hydroxyethyl cellulose,

hydroxypropyl cellulose,

xanthan gum, both food grade and industrial grade, and

mixtures of industrial grade xanthan gum and locust bean gum.

3,891,572

PRODUCTION OF STABLE DISPERSION OF SOLID PARTICLES ENCAPSULATED IN SYNTHETIC POLYMER

Anthony Gifford Moody, Alvanley, and Desmond Wilfrid John Osmond, Windsor, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 555,989, June 8, 1966, abandoned.
This application Oct. 30, 1969, Ser. No. 871,767
Claims priority, application United Kingdom, June 10, 1965, 24607/65
Int. Cl.[2] B01J *13/02*; B05D *1/02*, *3/10*
U.S. Cl. 252—316 5 Claims

1. A process of producing a stable dispersion of solid particles encapsulated in synthetic polymer comprising

forming a dispersion of said particles in a solution of an undercoating polymer and a stabilizing material and modifying said solution so that said undercoating polymer becomes insoluble therein, thereby forming particles undercoated with the undercoating polymer,

carrying out dispersion polymerization of monomer in an organic liquid containing 0 to 25 percent by weight water in which the monomer is soluble to the extent of at least about twice the highest free monomer content arising during the polymerization, and in which the resulting polymer is insoluble, the organic liquid also containing (i) a dispersion stabilizer comprising (a) an anchoring component which is a polymer or copolymer of at least one ethylenically unsaturated monomer and which is insoluble in the liquid and is associated with said encapsulating polymer by London or vander Waals interaction and (b) a pendant chain-like component of at least twelve covalently linked atoms in length which is solvated by the organic liquid and provides a stabilizing sheath around the encapsulated particles and (ii) said undercoated particles,

said stabilizing material comprising an anchoring component which is associated with said undercoating polymer and a chain-like component which is solvated by said organic liquid and provides a stabilizing sheath around the undercoated particles,

said dispersion polymerization forming an encapsulating layer of said resulting polymer on said undercoated particles and said dispersion stabilizer stabilizing said encapsulated particles in said organic liquid.

3,891,573

AQUEOUS CHOLESTEROL STANDARD SOLUTION

Emil Stary, Hamburg; Peter Röeschlau, Tutzing, Obb, and Erich Bernt, Munich, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Apr. 30, 1974, Ser. No. 465,640
Claims priority, application Germany, May 14, 1973, 2324386
Int. Cl. G01n *33/16*
U.S. Cl. 252—408 22 Claims

1. Cholesterol standard solution comprising in aqueous solution

a. a defined amount of cholesterol;

b. 1 to 20 volume percent, based on the standard solution, of a primary or secondary aliphatic alcohol of up to 4 carbon atoms;

c. 5 to 20 volume percent of hydroxy-polyethoxydodecane or 40 to 60 volume percent of diethyleneglycol monobutyl ether; and

d. at least one of

i. 0.5 to 5 weight percent of sodium chloride; and
ii. 0.01 to 0.5 weight percent of alkyl dimethyl benzyl ammonium chloride of from 8 to 18 carbon atoms in the alkyl moiety.

3,891,574

HOLLOW SPHERES OF ACTIVATED CARBON AND METHOD FOR MANUFACTURE THEREOF

Kazuo Kobayashi; Shinjiro Watari; Tsutomu Kato; Minoru Shiraishi, and Yoshio Kawana, all of Kawaguchi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Aug. 31, 1972, Ser. No. 285,509
Claims priority, application Japan, Nov. 15, 1971, 46-91287
Int. Cl. C01b *31/08*
U.S. Cl. 252—421 1 Claim

1. A method for the manufacture of a hollow sphere of activated carbon, which method consists essentially of:

A. blending finely pulverized coal with a hydrophilic binder selected from the group consisting of pitch emulsion, spent sulfite pulp liquor and carboxymethylcellulose;
B. coating a layer of the blend from Step (A) on a 2 to 5 mm diameter spherical core of styrene resin having a lower melting point than said coal, the coated sphere having a 7 to 12 mm diameter;
C. drying the coated sphere of Step (B);
D. subjecting the coated sphere of Step (C) to heat treatment in a nitrogen atmosphere at a temperature higher than the decomposition temperature of the core, the heat treatment being at a rate such that inner pressure of the coated sphere is below the pressure that will crack or disintegrate the layer of finely divided coal, thereby causing the core to be decomposed and evacuated within the shell of carbon and, at the same time, allowing gas emanating from the decomposed core to form fine pores extending from the inner to the outer surface of the shell;
E. sintering the resulting hollow sphere of coal from Step (D) at temperatures between the first-order decomposition temperature of the raw material coal and 550°C.;
F. dehydrogenating the sintered hollow sphere of carbon from Step (E) in an atmosphere of inert nitrogen gas at a temperature of from 600° to 1,100°C.; and
G. activating both the inner and outer surfaces of the hollow sphere of carbon from Step (F) in a current of reactive gas consisting essentially of steam at temperatures exceeding 750°C.

3,891,575

CATALYST FOR PURIFYING EXHAUST GASES

Hans Bräutigam, Grossburgwedel; Günter Weidenbach, Anderten, and Karl Hermann Koepernik, Hannover, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Jan. 25, 1974, Ser. No. 436,726
Claims priority, application Germany, Jan. 27, 1973, 2304001; Jan. 30, 1973, 2304351; Oct. 12, 1973, 2351237
Int. Cl.[2] B01J *29/06*
U.S. Cl. 252—455 R 28 Claims

1. In a process for the preparation of a highly heat resistant, thermal shock resistant and break resistant catalyst suitable for the purification of exhaust gases, comprising the steps of coating a non-rusting, scale-free highly heat resistant metal skeleton with a layer of a catalytically active carrier material, calcining the coated skeleton at a temperature of from about 600° to 1200°C. and distributing one or more catalytically active metals or metal oxides upon the layer of catalyst carrier, the improvement which comprises coating said skeleton with an elastic primer layer comprising aluminum silicate prior to applying said layer of catalytically active carrier material.

18. In a highly temperature resistant, thermal shock resistant and break resitant catalyst suitable for the purification of exhaust gases, comprising a non-rusting, scale-free, highly heat resistant metallic skeleton having thereon an outer layer comprising a catalytically active carrier material and one or more catalytically active metals or metal oxides distributed on said carrier layer, the improvement comprising an elastic priming layer comprising aluminum silicate between said skeleton and said outer layer.

3,891,576

PROCESS

Hendrik Adrian Jacobus Battaerd, North Clayton; Brian Alfred Bolto, Mitcham, and Pir Ghulam Samadani Shah, East Kew, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia and Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed May 14, 1973, Ser. No. 360,188
Claims priority, application Australia, May 31, 1972, 9168/72
Int. Cl. C08f *15/00*
U.S. Cl. 260—2.1 R 10 Claims

1. A process of manufacturing a polymeric composition which process comprises reacting in the presence of a free radical initiator a heterogeneous mixture comprising an aqueous solution of an allylamine salt containing more than one allyl substituent of a strong acid and a compound selected from the group consisting of ethylenically unsaturated acids and organic derivatives of ethylenically unsaturated acids said mixture being characterised in that a major proportion of the said compound is present in a separate phase finely dispersed in the aqueous solution.

3,891,577

PROCESS OF PREPARING VESICULATED POLYMERS

Robert William Kershaw, South Blackburn; Frederick John Lubbock, Beaumaris, and Livia Polgar, Caulfield, all of Australia, assignors to Balm Paints Limited, Melbourne, Australia

Filed Dec. 1, 1970, Ser. No. 94,171
Claims priority, application Australia, Dec. 1, 1969, 64565/69
Int. Cl. C08f *47/08*
U.S. Cl. 260—2.5 R 7 Claims

1. A process of preparing vesiculated polymer which comprises converting to solid non-porous polymer the liquid medium of a dispersion in which particles of another polymer are dispersed, the dispersed particles being swollen by a liquid swellant, whereby there is formed solid polymer containing said swollen polymer particles,

and thereafter removing at least part of said swellant from said swollen polymer particles to form a plurality of isolated vesicles within a matrix of solid non-porous polymer.

3,891,578

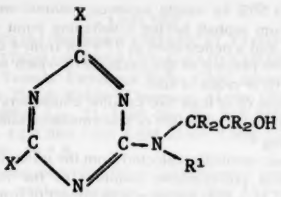
CARBODIIMIDE-ISOCYANURATE FOAMS CONTAINING URETHANE LINKAGES

Peter T. Kan, Plymouth, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 17, 1973, Ser. No. 425,270
Int. Cl. C08g *22/36, 22/34, 33/04*
U.S. Cl. 260—2.5 AC 10 Claims

1. A process for the preparation of a cellular foam characterized by carbodiimide-isocyanurate-urethane linkages which comprises reacting an organic polyisocyanate and a polyol in the presence of a catalytically sufficient amount of a catalyst system comprising

a. an s-triazine compound selected from the group consisting of 2,4,6-tris(diethanolamino)-s-triazine, 2,4,6-tris(diisopropanolamino)-s-triazine, 2,4,6-tris(dibutanolamino)-s-triazine, 2,4,6-tris(N-methylethanolamino)-s-triazine, and unsymmetrically substituted triazines of the formula:



wherein R is hydrogen or lower alkyl of from 1 to 10 carbon atoms, R^1 is CR_2CR_2OH or lower alkyl of from 1 to 12 carbon atoms, X is NR_2, alkoxy of from 1 to 12 carbon atoms, phenoxy atoms, alkyl of from 1 to 12 carbon atoms, phenyl, hydroxyl, halogen, aziridyl, pyrrolidyl, piperidyl, or N-alkylpiperazyl, and

b. a compound which promotes urethane linkages.

3,891,579

PROCESS FOR THE PREPARATION OF ISOCYANURATE FOAMS EMPLOYING HALOGENATED ALIPHATIC ALKANOL ACCELERATORS

Moses Cenker, Trenton, and Thirumurti L. Narayan, Riverview, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 25, 1974, Ser. No. 445,110
Int. Cl. C08g *22/44, 33/02*
U.S. Cl. 260—2.5 AW **8 Claims**

1. A process for the preparation of a cellular foam characterized by isocyanurate linkages which comprises condensing an organic polyisocyanate in the presence of:

a. a blowing agent,

b. a catalytically sufficient amount of a tertiary amine trimerization catalyst, and

c. from 0.1 part to 10 parts by weight based on the weight of the organic polyisocyanate of a monohydric halogenated alkanol having from 1 to 6 carbon atoms.

3,891,580

REACTION OF FINE MEDIA MILLER STRACH OR PROTEIN WITH A POLYMER OR POLYMERIZABLE MONOMER

Horton Harold Morris, Macon; Richard Jacob Drexel, Jr., Irwinton, and Kenneth Lamar Turner, Gordon, all of Ga., assignors to Freeport Minerals Company, New York, N.Y.

Division of Ser. No. 14,244, Feb. 25, 1970, Pat. No. 3,804,653, which is a continuation-in-part of Ser. No. 817,258, April 10, 1969, abandoned, which is a continuation of Ser. No. 599,372, Dec. 6, 1966, abandoned. This application Oct. 26, 1973, Ser. No. 410,161
Int. Cl. C08h *7/00*
U.S. Cl. 260—8 **16 Claims**

1. A process for preparing a polymeric material which comprises subjecting an aqueous mixture comprising (1) a starch having hydroxyl, aldehyde or ketonic groups, or a protein having amino or amido groups, and (2) grinding media, to an agitation thereby milling the starch or protein, said grinding media comprising about 30 to 70 volume percent of the total mixture and being smaller than one-half inch in overall diameter and larger than 400 mesh, and reacting the milled starch or protein with a polymer or polymerizable monomer which is reactive with the hydroxyl, aldehyde or ketonic groups of the starch or the amido or amido groups of the protein.

3,891,581

WATER DILUTABLE TRANSFER INK COMPOSITIONS

Domenic Argenio, 5 Briarwood Ct., West Paterson, N.J. 07424

Filed Mar. 21, 1973, Ser. No. 343,361
Int. Cl.² B41M *3/12;* **C08L** *1/26;* **D06P** *1/44;* **C08L** *93/04*
U.S. Cl. 260—16 **6 Claims**

1. A water-dilutable, heat transfer ink composition comprising:

A. 5–60% by weight of water as a solvent component;

B. 1–35% by weight of at least one disperse dye capable of sublimation at temperatures in the range of about 375°F to 425°F;

C. 5–40% by weight of a thermoplastic resin produced by reacting a polyol partially esterified rosin with a diabasic acid selected from the group consisting of maleic anhydride, fumaric acid, or a combination of maleic anhydride and fumaric acid, said resin having an acid number between about 75 and 300 and a melting pont between about 90°C and 190°C;

D. 1–10% by weight of a water or alkali-soluble polymer selected from the group consisting of methyl cellulose, sodium carboxymethyl cellulose, carboxymethyl cellulose, carboxymethylhydroxyethyl cellulose and hydroxypropyl cellulose; and

E. An amount of an alkaline component compatible with said remaining components to maintain the pH of said ink composition in the range of about 8 to 9.

3,891,582

JOINT CEMENT COMPOSITIONS UTILIZING WATER-INSOLUBLE CARBOXYMETHYLATED CELLULOSE DERIVATIVES AS ASBESTOS SUBSTITUTES

Armand J. Desmarais, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 26, 1973, Ser. No. 354,834
Int. Cl.² C08F *45/18;* **C04B** *31/36, 11/08*
U.S. Cl. 260—17 R **1 Claim**

1. A joint cement composition consisting essentially, by weight, of 20 to 44 parts of a binder selected from the class consisting of poly(vinyl acetate), polyacrylamide, and copolymers of acrylamide and acrylic acid, 30 to 90 parts of mica, 0 to 100 parts of clay, and 190 to 350 parts of limestone as its principal dry ingredients, and containing about 0.5 to 1.5% by weight, based on the total weight of the dry components, of a fibrous, substantially water-insoluble carboxymethylated cellulose derivative having a fiber length of about 0.03 to 0.007 inch and selected from the class consisting of cross-linked carboxymethylcellulose, carboxymethylcellulose having a D.S. of about 0.2 to 0.5 and a carboxymethyl hydroxyethyl cellulose having carboxymethyl D.S. of about 0.1 to 0.4 and a maximum combined carboxymethyl D.S. and hydroxyethyl M.S. of about 0.7.

3,891,583

QUICK SETTING ADHESIVE FOR APPLICATION UNDERWATER

Richard W. Drisko, Oxnard, and Joseph B. Crilly, Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1974, Ser. No. 445,171
Int. Cl. C08q *51/72*
U.S. Cl. 260—18 EP **9 Claims**

1. A rapid-curing, epoxy adhesive for application on underwater structures and use underwater, comprising:

a. approximately 100 parts by weight of a viscous liquid epoxy polymer;

b. approximately 100 parts by weight of a high functionality liquid polymercaptan resin;

c. 6 to 10 parts by weight of 2,4,6-tri (dimethylaminomethyl)phenol;

d. 18 to 20 parts by weight of blown fish oil;
e. 0.01 to 0.05 parts by weight of carbon black;
f. 0 to 2 parts by weight of beta-(3,4-epoxycyclohexyl-ethyltrimethoxysilane; and
g. a thixotropic agent;
h. said viscous liquid epoxy polymer consisting of a polyfunctional polymer derived by the condensation polymerization of bisphenol A and epichlorohydrin, having an epoxide equivalent of approximately 190, a viscosity of about 125 poises at 25°C, and specific gravity of about 1.18 at 25°C;
i. said components being mixed together to a uniform blend immediately prior to use, and not being activated by water;
j. said adhesive compound displacing water and adhering well to cleaned surfaces or underwater structures when applied thereto and spread thereon underwater; and
k. said adhesive curing at from approximately 0°F to 80°F in from about 5 to 30 minutes to form a strong bond, and forming a very strong bond within 2 hours.

3,891,584

WATER-DISPERSIBLE HOT MELT ADHESIVES AND PRODUCTS USING SAME

Dilip K. Ray-Chaudhuri, Somerville; Jules E. Schoenberg, Scotch Plains, and Thomas P. Flanagan, Green Brook, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 22, 1974, Ser. No. 444,780
Int. Cl. C08d *9/12;* **C09j** *3/26*
U.S. Cl. 260—27 R **17 Claims**

1. A water-dispersible hot melt adhesive composition comprising

A. 75–95 parts by weight of graft copolymer of
i. about 40–80% by weight of vinyl monomer; and
ii. about 20–60% by weight of water-soluble polyalkylene oxide polymer having a molecular weight of about 3,000–20,000 and a polymerized ethylene oxide content of at least 50% by weight; and

B. 5–25 parts by weight of tackifying resin.

3,891,585

ELASTOMERIC PAVEMENT REPAIR COMPOSITION FOR PAVEMENT FAILURE AND A METHOD OF MAKING THE SAME

Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009

Continuation-in-part of Ser. No. 589,190, Oct. 21, 1966. This application July 5, 1973, Ser. No. 376,919
Int. Cl. C08c *11/68, 17/22;* **C08d** *9/00*
U.S. Cl. 260—28.5 AS **20 Claims**

1. An elastomeric pavement repair material which consists essentially of paving grade asphalt with a penetration range of 10 through 300 and particulate non-oil resistant asphalt soluble rubber which have been mixed in a ratio of about two to about three parts asphalt to about one part rubber and which have been heated together at a temperature within the range of about 350° and about 500°F to form a jellied composition.

3,891,586

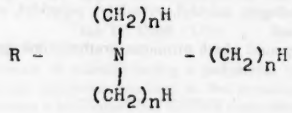
PRODUCT AND METHOD FOR REDUCING WATER IONS THROUGH SOIL BY SEEPAGE

Frank L. Califano, Hackensack; George Stepien, Jr., Montclair, and Thomas E. Russell, Whippany, all of N.J., assignors to The Flintkote Company, White Plains, N.Y.

Division of Ser. No. 296,114, Oct. 10, 1972, Pat. No. 3,831,382. This application Apr. 4, 1974, Ser. No. 457,969
Int. Cl. C08c *11/70*
U.S. Cl. 260—28.5 AS **6 Claims**

1. A composition for reducing the loss of water through the permeable ground surface of a water containment body such as a reservoir, pond, canal and the like, comprising:

a. a 25 to 50% by weight aqueous, cationic emulsion of a petroleum asphalt having a softening point of 90°F. to 200°F. and a penetration at 77°F. of from 4 dmm to 205 dmm, 90 percent of the particles of which are less than about 10 microns in size;
b. a mixture of at least two cationic emulsifiers in from 0.3 to 1.2 percent by weight of said emulsion, said emulsifiers including
1. a basic emulsifier selected from the group consisting of N-alkyl polyethylene diamines of the formula $R—NH(CH_2)_wNH_2$ where w is an integer of from 2 to 4 and R represents an aliphatic hydrocarbon containing from 8 to 22 carbon atoms; and
2. an emulsification aid-break suppressant selected from the group consisting of alkyl quaternary ammonium compounds of the formula



where n is from 1 to 2 and R represents an aliphatic hydrocarbon containing from 8 to 22 carbon atoms, said basic emulsifier and said emulsification aid-break suppressant being present in a weight ratio to one another of from 1:2 to 2:1;
c. a non-ionic surface active agent in from 0.1 to 1.5 percent by weight of said emulsion, selected from the group consisting of alkyl aryl polyether alcohols, polyethoxylated nonylphenols (average ethylene oxide content of 4–12 mols per mol of nonylphenol), benzyl ethers of octyl phenol and linear organic alcohols;
d. from 1 to 10 percent by weight of said emulsion of an elastomeric material; and
e. an acid in sufficient quantity to set the pH of said composition at from 5 to 7.

3,891,587

SYNERGISTIC ANTIBLOCK SYSTEMS FOR AN ETHYLENE/VINYL ACETATE COPOLYMER

William A. Watts, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 29, 1974, Ser. No. 465,391
Int. Cl. C08c *11/70*
U.S. Cl. 260—28.5 AV **4 Claims**

1. A thermoplastic composition which comprises 100 parts by weight of an ethylene/vinyl acetate copolymer, characterized by having a melt index in the range of about 1.2 to about 20 grams/ten minutes according to ASTM No. D 1238, resulting from the reaction of about 72 to about 80 parts by weight ethylene and, correspondingly, about 28 to about 20 parts by weight vinyl acetate wherein said thermoplastic composition contains about 0.15 to about 3 total parts of a combination containing about 0.02 to about 1 part by weight of each individual modifier, said combination selected from (1) stearamide and behenamide, (2) stearamide, behenamide and stearic acid, (3) stearamide, stearic acid and paraffin wax, (4) behenamide, stearic acid and paraffin wax and (5) stearamide, behenamide, stearic acid and paraffin wax, where said paraffin wax is characterized by having a softening point of about 45°C to about 55°C.

3,891,588

NONSETTLING RUBBER CHEMICAL COMPOSITION AND METHOD OF PREPARING SAID COMPOSITION

Harry W. Tausch, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 21, 1969, Ser. No. 818,080

Int. Cl. C08d *7/04;* **C08f** *45/00;* **C08g** *51/00*

U.S. Cl. 260—29.7 R **14 Claims**

1. A process of preparing a compounded polymer latex containing a rubber chemical comprising (A) preparing a resin/rubber chemical composition by grinding in an aqueous medium, containing a dispersing agent and consisting essentially of water, a mixture of tackifying friable hydrocarbon resin and a friable rubber chemical the friable hydrocarbon resin and weight ratio of the friable hydrocarbon resin to the friable rubber chemical being selected to produce, on grinding, particles, the average specific gravity of the particles differing by a lesser degree from the specific gravity of the latex serum than does the specific gravity of the friable rubber chemical, and grinding the friable mixture for a time sufficient to produce dispersible particles, over half of the particles possessing a particle size of from 0.01 micron to 100 microns and wherein the weight ratio of the friable hydrocarbon resin to the friable rubber chemical is determined by the following relationship:

$$\frac{x}{SG_A} + \frac{SG_c - x}{SG_B} = 1$$

wherein x/SG_c is the weight fraction of the hydrocarbon resin, $SG_c - x/SG_c$ is the weight fraction of the friable rubber chemical, SG_c is the specific gravity of the combination, SG_A is the specific gravity of the friable hydrocarbon resin, and SG_B is the specific gravity of the friable rubber chemical and wherein SG_c is closer to the specific gravity of the latex serum than is SG_B, and (B) combining the polymer latex and the resin/rubber chemical composition under agitation wherein the resin/rubber chemical composition is added in an amount sufficient to provide an additive amount of the rubber chemical.

3,891,589

PROCESS FOR PREPARING STABLE HIGH SOLIDS AQUEOUS SOLUTION OF CATIONIC THERMOSETTING RESINS

Dilip K. Ray-Chaudhuri, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 317,424, Dec. 21, 1972, abandoned. This application Aug. 29, 1974, Ser. No. 501,483

Int. Cl.[2] **C08L** *63/00;* **C08G** *69/48*

U.S. Cl. 260—29.2 EP **7 Claims**

1. A process for preparing an aqueous solution of a cationic thermosetting resin having a total solids content of 15–55% by weight of the solution, said solution having improved storage stability, said process comprising the steps of:

A. reacting at 110°–250°C.

i. at least one polyalkylene polyamine corresponding to the formula:

$$H_2N—[(CH_2)_n—NR]_mH$$

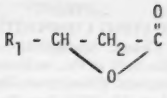
wherein n is an integer having a value of from 2 to 6 inclusive, m is an integer having a value of from 1 to 6 inclusive, and R is selected from the group consisting of hydrogen atoms and alkyl radicals, or

ii. the reaction product of at least one polyalkylene polyamine corresponding to the formula:

$$H_2N—[(CH_2)_n—NR]_mH$$

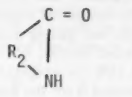
wherein n is an integer having a value of from 2 to 6 inclusive, m is an integer having a value of from 1 to 6 inclusive, and R is selected from the group consisting of hydrogen atoms and alkyl radicals with at least one compound selected from the group consisting of:

a. a beta-lactone corresponding to the formula:



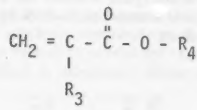
wherein R_1 is selected from hydrogen atoms and saturated, aliphatic straight chain hydrocarbon radicals containing from one to 16 carbon atoms;

b. a lactam corresponding to the formula:



wherein R_2 is a divalent radical selected from the group consisting of aliphatic hydrocarbons containing from three to 18 carbon atoms; and

c. an ester corresponding to the formula



wherein R_3 is a hydrogen or methyl, and R_4 is an alkyl radical having from one to four carbon atoms;

with at least one saturated dicarboxylic acid, dialkyl ester or anhydride thereof containing from two to 20 carbon atoms, in a molar ratio of polyamine to acid reagent ranging from 0.9 to 1.5, to produce a copolyamide-polyamine intermediate having a reduced specific viscosity at 1% by weight resin solution in methanol at 25°C. of 0.05 to 0.18; and

B. reacting, in aqueous medium, resultant (co)-polyamidepolyamine intermediate from step A with epichlorohydrin in a concentration ranging from 1.25 to 4.0 moles of epichlorohydrin per equivalent weight of copolyamide-polyamine intermediate to form the aqueous cationic thermosetting resin solution, said reaction of the intermediate with the epichlorohydrin being conducted initially at temperatures from 25° to 40°C. for a period of 1 to 4 hours and thereafter at 50° to 90°C. for a period of 2 to 10 hours.

3,891,590

CURABLE AMINO RESINS

Richard D. Sundie, Montvale, and Walter L. Pennie, Morristown, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 210,160, Dec. 20, 1971, abandoned. This application Jan. 7, 1974, Ser. No. 431,535

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.4 R **19 Claims**

1. A composition consisting essentially of:

a. urea present in an amount ranging from about 15 to about 25 weight percent;

b. formaldehyde present in an amount ranging from about 30 to about 70 weight percent;

c. melamine present in an amount ranging from about 4.5 to about 10 weight percent;

d. water present in an amount ranging from about 10 to about 30 weight percent; and

e. a stabilizer present in an amount ranging from about 0.05 to about 4.0 weight percent, said stabilizer comprising a buffering agent which maintains the pH of the composition at a value ranging from about 4.0 to about 7.5.

3,891,591
COATING COMPOSITIONS

David Chi-kung Chang, Springfield, and Maurice James McDowell, Media, both of Pa., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Aug. 13, 1973, Ser. No. 388,061
Int. Cl. C08f 37/18, 45/24
U.S. Cl. 260—29.6 WB 20 Claims

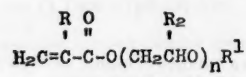
1. An aqueous coating composition comprising:

a. an aqueous dispersion of at least one particulate water insoluble copolymer of ethylenically unsaturated monomers of 2 to 20 carbon atoms containing a water-soluble non-ionic surfactant, said copolymer containing about 0.5 to 10% by weight of ethylenically unsaturated acid monomer units and having a number average molecular weight of at least 50,000;

b. about 0.2 to 10% by weight, based on total solids, of a thickener selected from the group consisting of

1. a copolymer of 99–50% by weight of an α,β-ethylenically unsaturated carboxylic acid and 1–50% by weight of at least one alkyl acrylate or alkyl methacrylate wherein the alkyl group is from 10 to 30 carbon atoms,

2. a copolymer of 15–99% by weight of acrylic acid or methacrylic acid, 0–30% by weight of an alkyl acrylate or alkyl methacrylate wherein the alkyl group is from 10 to 30 carbon atoms and 1–55% by weight of an ester of the formula



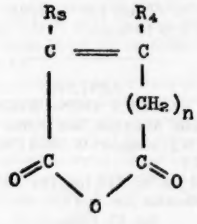
wherein

R^2 and R are hydrogen or methyl,

n is an integer of 6 to 80, and

R^1 is alkyl of 1 to 20 carbon atoms or alkylphenyl where the alkyl is from one to 20 carbon atoms,

3. a mixture of (i) 1 to 50 parts by weight of a copolymer of about 2–50% by weight of itaconic anhydride or a compound of the formula



wherein

R_3 and R_4 are hydrogen, halogen, —CN, alkyl of one to six carbons, phenyl, benzyl or a cycloaliphatic radical of three to six carbons, and

n is 0 to 3 and

about 98–50% by weight of an alkene of two to nine carbons, vinyl acetate, styrene, vinyl chloride, methyl vinyl ether, ethyl vinyl ether, indene, cinnamic acid alkyl ester, acenaphthalene, acrylonitrile or an alkyl ester of acrylic acid or methacrylic acid wherein the alkyl group is one to 18 carbon atoms, with (ii) 1 part by weight of a compound of the formula

wherein

R_5 is alkyl of one to 18 carbons or aryl of six to 20 carbons,

R_6 is H or methyl,

n is a positive integer of 2 or 3, and

m is a positive integer of 1 to 100, and

(4) mixtures thereof; and

c. about 0.01–5% by weight, based on total solids, of a segmented, hybrid fluorine-containing compound, [H] — [F], comprising a balance of the following:

1. one or more [H] segments containing at least one water-solvatable polar group and substantially free from fluorinated aliphatic pendant groups of at least three carbon atoms terminated by trifluoromethyl groups, and in which at least 10% by weight of the [H] segments are the water-solvatable polar groups, and

2. one or more [F] segments substantially free from water-solvatable polar groups, containing from 2 to 85% by weight of three to 30 fully fluorinated carbon atoms terminated by trifluoromethyl groups and providing in the fluorocarbon at least 1% by weight of bound fluorine, the intraconnecting structure of the [F] segments being substantially free of fluorine,

said composition having a pH in the range of about 7 to 10.5.

3,891,592
PROCESS FOR PRODUCING RUBBER POLYMER LATICES WITH LARGE PARTICLES

Bernard Chauvel, Ermont, and Jean-Claude Daniel, Fontenay-sous-Bois, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed July 10, 1974, Ser. No. 487,217
Claims priority, application France, July 11, 1973, 73.25393
Int. Cl.[2] C08L 9/04, 9/08
U.S. Cl. 260—29.7 E 11 Claims

1. A process for the preparation of rubber polymer latices having large particles, which comprises polymerizing in aqueous emulsion a conjugated aliphatic diolefin containing from four to eight carbon atoms, alone or in mixture with at least one copolymerizable monomer, in the presence of 1–100,000 parts per million of an agglomerating agent, characterized in that the agglomerating agent which is represented by a polyalkyleneglycol is introduced in the course of polymerization, i.e., before polymerization has been completed, at a temperature of from 25° to 90°C when at least 40% by weight of a polymer or copolymer, which is slightly cross-linked, is formed.

3,891,593
METHOD AND APPARATUS FOR DISSOLUTION OF POLYMER IN SOLVENT

Chester L. Smitherman, Jr.; Robert H. Overcashier, and Vitold R. Kruka, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 8, 1972, Ser. No. 279,132
Int. Cl. B01f 1/00; C08f 45/28; F17d 1/16
U.S. Cl. 260—34.2 14 Claims

1. A method for dissolving an essentially undegraded polymer in a solvent comprising:

introducing the essentially undegraded polymer into the solvent to form a slurry of small undegraded solid particles in the solvent;

providing a vapor zone above a liquid zone in a vessel which is partitioned into at least two compartments which are in

liquid communication with each other both above and below the partition;
dispersing the slurry in the liquid zone;
admitting a dispersed stream of gas into at least one but less than all of the compartments, whereby the slurry content of each compartment into which gas is flowing is caused to rise in the compartment, flow into another compartment over the top of the partition, descend into the other compartment and flow back into each of the compartments into which the dispersed stream of gas is introduced;
recycling gas from the vapor zone; and
removing dissolved essentially undegraded polymer and solvent from the liquid zone.

3,891,594

DIRECT SYNTHESIS OF COMPOSITE MATERIALS

Lynn J. Taylor, 3704 Dewlawn Dr., Toledo, Ohio 43614

Continuation of Ser. No. 242,132, April 7, 1972, Pat. No. 3,817,911. This application Apr. 19, 1974, Ser. No. 462,321
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 N **11 Claims**

1. A process for preparation of a composite material of at least one organic polymer having at least one inorganic oxide dispersed therein, which process comprises:
a. mixing together at least one non-polymeric organic precursor and at least one inorganic-oxide hydrolyzable precursor;
b. polymerizing the non-polymeric organic precursor;
c. synthesizing the inorganic oxide from the hydrolyzable precursor so as to prepare the inorganic oxide in situ of the previously synthesized organic polymer; and
d. recovering the resulting composite material.

3,891,595

FRICTION MATERIAL

James Derek Birchall, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 24, 1973, Ser. No. 391,515
Claims priority, application United Kingdom, Aug. 30, 1972, 40189/72
Int. Cl. C08g *51/04*
U.S. Cl. 260—38 **19 Claims**

1. A friction material comprising from 40 to 85 percent by weight of a synthetic inorganic polycrystalline refractory metal oxide fibre having an average fibre diameter of from 0.5 to 10 microns having a shot content of less than 5 percent by weight,
and from 15 to 35 percent by weight of a binder.

3,891,596

THERMOPLASTIC INGREDIENT FOR MOLDING COMPOUNDS

Michael G. Roberts, Heath, and Michael L. Matuszak, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 361,663, May 18, 1973, Pat. No. 3,843,750. This application July 1, 1974, Ser. No. 484,641
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R **10 Claims**

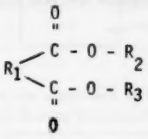
1. A thermosetting molding compound comprising the following materials in approximate percentages by weight:

Glass fiber reinforcement	5–40%
Alkaline earth oxide gelling agent	0.01–10%
Polymerization catalyst	0.05– 5%
Fillers	10–50%
Resin matrix forming material	40–95%

wherein said resin matrix forming material comprises the following mixture in percent by weight:

Thermosetting resin polymer	60–90%
Thermoplastic resin polymer	5–50%
Unsaturated solvent for said polymer and prepolymer	0–45%

and wherein said thermoplastic polymer is a heteropolymer of a mixture of alkene radical containing monomers which include from approximately 5% by weight to approximately 95% by weight of a material having the formula:



wherein: R_1 is a chlorinated or brominated divalent organo radical devoid of ethylenic unsaturation, R_2 is a saturated monovalent organo radical or substituted organo radical, and R_3 is an alkene radical or substituted alkene radical.

3,891,597

ROTATIONAL MOLDING OF CROSSLINKABLE POLYMERS

Donald G. Needham, Ramona, and George R. Hill, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 100,442, Dec. 21, 1970, abandoned. This application Aug. 2, 1973, Ser. No. 384,997
Int. Cl. C08f *47/04, 27/00, 27/22*
U.S. Cl. 260—42.21 **7 Claims**

1. In the rotational molding of homopolymers and copolymers of ethylene and olefin hydrocarbonshaving 3 to 8 carbon atoms per molecule, which polymers contain a crosslinking agent selected from the group consisting of 2,5-dimethyl-2,5-di(t-butylperoxy)-hexyne-3 and 2,5-dimethyl-2,5-di(peroxybenzoate)hexyne-3 and a colorant selected from the group consisting of ultramarine blue and phthalocyanine green, the method of increasing the gel time of the polymer composition in the mold which comprises adding to the composition at least one material selected from the group consisting of 2-hydroxy-4-n-octoxybenzophenone and N,N-bis(hydroxyethyl) alkylamine, said material being added in an amount in the range of about 0.05 to about 0.5 weight percent of the composition.

3,891,598

BUBBLE-FREE, HIGH BARRIER VINYLIDENE CHLORIDE POLYMER FILMS AND PROCESS OF PREPARATION

Richard T. Marzolf, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 323,315, Jan. 12, 1973, abandoned. This application Feb. 11, 1974, Ser. No. 441,541
Int. Cl. C08f *37/02, 45/04, 45/56*
U.S. Cl. 260—42.56 **3 Claims**

1. An improved process for preparing extruded vinylidene chloride polymer film containing modifying amounts of an ethylene-vinyl acetate copolymer, said film being substantially free from bubbles, holes and white specks which process comprises
1. preparing a blend of (a) a dry, powdered, nonplasticized normally crystalline vinylidene chloride polymer con-

tainiing from about 70 to about 95 percent by weight of vinylidene chloride interpolymerized with from about 30 to about 5 percent by weight of at least one monoethylenically unsaturated monomer copolymerizable with vinylidene chloride, with (b) from about 0.05 to about 1 percent based on polymer weight of magnesium oxide having an average particle size of less than about 0.5 micron and wherein said blend is prepared by introducing said magnesium oxide beneath the surface of the mass of dry vinylidene chloride polymer particles while said particles are maintained in motion and where said magnesium oxide coats said particles prior to contact of said magnesium oxide with a metal surface,

2. removing from said blend any agglomerate having a diameter in excess of about 500 microns, then
3. admixing said blend with said ethylene-vinyl acetate copolymer in an extruder which is used to thermally fabricate the admixture into film form.

3,891,599

FIRE RETARDANT POLYMER COMPOSITIONS

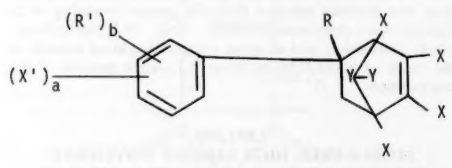
Harry W. Marciniak, Tonawanda; Richard D. Carlson, Grand Island, both of N.Y., and James L. Dever, Bedford, Ohio, assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 199,035, Nov. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 65,663, Aug. 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 51,008, June 29, 1970, abandoned. This application Nov. 14, 1973, Ser. No. 415,915

Int. Cl. C08d *7/10*

U.S. Cl. 260—45.7 R **27 Claims**

1. A fire retardant polymer composition comprising a polymer selected from the group consisting of thermoplastic and thermosetting polymers and elastomers and an effective fire retardant proportion of a compound of the formula:



wherein X is a halogen selected from the group consisting of fluorine, chlorine, bromine and mixtures thereof; Y is a substituent selected from the group consisting of chlorine, bromine and fluorine, alkyl of 1 to 10 carbon atoms, halogen substituted alkyl of 1 to 10 carbon atoms, alkoxy of 1 to 10 atoms, and halogen substituted alkoxy of 1 to 10 carbon atoms, wherein the halogen is chlorine, fluorine or bromine; X′ is a halogen independently selected from the group consisting of chlorine, bromine and mixtures thereof; R and R′ are independently selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and halogen substituted alkyl of 1 to 6 carbon atoms wherein said halogen is selected from the group consisting of fluorine, chlorine and bromine; *a* is about 4 to 5, *b* is 0 to about 1, and *a* + *b* is 5.

3,891,600

HALOGEN CONTAINING FIRE RETARDANT ADDITIVE WITH IMPROVED HEAT STABILITY

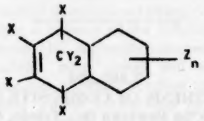
James J. Maul, and Richard D. Carlson, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 388,703, Aug. 15, 1973. This application Jan. 2, 1974, Ser. No. 429,608

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.75 R **14 Claims**

1. A fire retardant polymeric composition comprising a polymer and an effective fire retardant amount of a compound of the formula



wherein X is a halogen independently selected from the group consisting of fluorine, chlorine, and bromine, Y is independently selected from the group consisting of fluorine, chlorine, bromine, alkyl of 1 to 10 carbon atoms, alkyloxy of 1 to 10 carbon atoms, mono-haloalkyl and alkyloxy wherein said alkyl group contains 1 to 10 carbon atoms wherein said halo is fluoro, chloro, or bromo, Z is a halogen selected from the group consisting of chlorine, bromine, and mixtures thereof, and n is 1 to 8.

3,891,601

PROCESS FOR PRODUCING WATER SOLUBLE POLYAMIDE RESINS

Marvin A. Peterson; Adrian J. Good, and Thaddeus P. Kurek, all of Fort Wayne, Ind., assignors to Valspar Inc., Minneapolis, Minn. and General Electric Company, Ft. Wayne, Ind.

Continuation of Ser. No. 122,050, March 8, 1971, abandoned. This application June 4, 1973, Ser. No. 366,649

Int. Cl. C08j *20/32*

U.S. Cl. 260—47 CP **11 Claims**

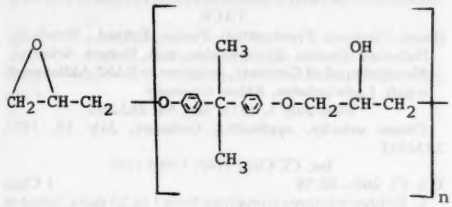
1. A process for producing a polyamide resin from an aromatic dianhydride and an aromatic diamine comprising the steps of adding to a reaction vessel an essentially anhydrous organic solvent having functional groups which are nonreactive with the polymer-forming reactants and a solvent for at least said aromatic dianhydride; adding to the solvent an anhydrous aromatic dianhydride in powder form; and thereby forming a slurry of such aromatic dianhydride within said solvent by combining therewith a measured amount of the aromatic dianhydride which is in excess of its solubility limits within said solvent; charging to said vessel a quantity of aromatic diamine in close succession to the formation of said slurry before said slurry precipitates into an insoluble mass; converting by condensation reaction a difunctional diprimary diamine and aromatic carbocyclic dianhydride to form a diorthoamic acid precrusor compound having a greater solubility in said solvent than either of said reactants; said compound being of molar proportions consisting of two parts of one of said reactants to one part of the other of said reactants; and controlling the temperature of the mixture within said reaction vessel by cooling the reaction mass to maintain a temperature below the imidization temperature of such reaction product.

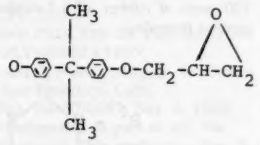
3,891,602
EPOXY SCALE-RESISTANT COATING

James W. Hughes, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 212,631, Dec. 27, 1971, Pat. No. 3,799,797. This application Sept. 24, 1973, Ser. No. 399,906
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EN 4 Claims

1. A novel scale-resistant modified epoxy resin made by the curing reaction of an epoxy resin prepared by combinind epichlorohydrin and p,p′-isopropylidene diphenol having the structural formula:





where $n = 0$ to 30
and a monohydric polyether which is represented by the formula

$$R{-}O{-}(CH_2{-}CHR'{-}O{-})_nH$$

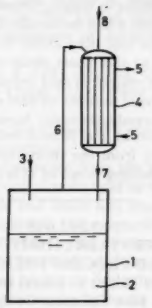
wherein R= alkyl, aryl, or other radical which is non-reactive with isocyanate functional groups, R′=alkyl and n=about 3 to about 50′′,with a blocked polyisocyanate selected from the group consisting of toluene disocyanate 1,5-napththalene diisocyanate, m-and p-phenylene diisocyanates, 4,4′ diphenyl-isopropylidene diisocyanate, 4,4′-diphenysulfone diisocyanate, 4,4′ diphenylmethane diisocyanate, and 4,4′,4′′triphenylmethane triisocyanate, the isocyanate being blocked with agents selected from the group consisting of hydrogen cyanide, ethyl malonate, acetylacetone, hydroxylamine, aryl mercaptans, monomethylaniline, diphenylamine, phenols, σ-pyrrolidone and caprolactam.

3,891,603
REMOVING HEAT OF REACTION IN COPOLYMERIZATION OF ETHYLENE IN AQUEOUS DISPERSION

Eduard Heil, Limburgerhof; Karl Kuchner, Ludwigshafen; Wolfgang Sliwka, Weinheim, and Harald Smits, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Dec. 28, 1973, Ser. No. 429,090
Claims priority, application Germany, Jan. 3, 1973, 2300111
Int. Cl. C08f *1/11, 1/98*
U.S. Cl. 260—63 R 7 Claims

1. Method for manufacturing copolymers of ethylene with 10 to 98 percent by weight of one or more of a vinyl ester of an organic alkanoic acid containing 1 to 12 carbon atoms in the alkyl group, an olefinically unsaturated carboxylic acid with 1 to 12 carbon atoms, an alkyl ester of said olefinically unsaturated acid, an amide of said olefinically unsaturated acid, a nitrile of said olefinically unsaturated acid, vinyl chloride, vinylethylketone, vinylsulfonic acid, or a hydroxyalkyl acrylate, by polymerization thereof in aqueous dispersion, at least a part of the heat of polymerization being removed by evaporation of the ethylene, the ethylene vapors being cooled by a cooling medium, by indirect heat exchange, in an indirect heat exchanger in a cooling zone situated above the polymerization vessel and in communication with the latter, the cooled vapors being returned to the polymerization vessel, wherein



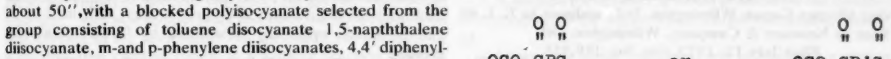
the vapors are fed to the upper end of the cooling zone and cooled while they are flowing downward.

3,891,604
SEGMENTED THERMOPLASTIC COPOLYESTER ELASTOMER

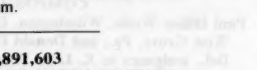
James Richard Wolfe, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 29, 1973, Ser. No. 419,975
Int. Cl. C08g *17/08*
U.S. Cl. 260—75 R 11 Claims

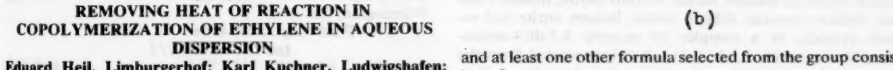
1. A segmented thermoplastic copolyetherester having improved tear strength consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by at least one of the formulae:



and said short chain ester units being represented by the formula:



and at least one other formula selected from the group consisting of:



wherein:

G is a divalent radical remaining after the removal of terminal hydroxyl groups from a long chain glycol having a molecular weight of about 400–6000 and a carbon-to-oxygen ratio of about 2.0–4.3;

R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300;

R′ is a divalent radical, containing at least one side chain of 7 to about 25 carbon atoms in length, remaining after removal of carboxyl groups from an aliphatic dicarboxylic acid, said aliphatic dicarboxylic acid having a molecular weight of less than about 300 neglecting the side chains;

D is a divalent radical remaining after removal of hydroxyl groups from a diol a molecular weight less than about 250; and D' is a divalent radical, having at least one side chain of 7 to about 25 carbon atoms in length, remaining after removal of hydroxyl groups from a low molecular diol, said diol having a molecular weight of less than about 250 neglecting the side chains; provided, (a) said short chain units amount to about 25 to 90 percent by weight of said copolyester; (b) about 5 to 55 percent of the total number of said short chain ester units contained in said copolyetherester have said side chains; and (c) a homopolymer in the fiber-forming molecular weight range formed solely from the short-chain ester units without side chains has a melting point of at least 150°C.

3,891,605
BROMINATED PENTAERYTHRITOLIC POLYESTERS AND PROCESS THEREFOR

Eric R. Larsen, and Ernest L. Ecker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1974, Ser. No. 457,951
Int. Cl. C08g *17/003, 17/12*
U.S. Cl. 260—75 H **20 Claims**

1. A process for preparing brominated pentaerythritolic polyesters comprising reacting pentaerythritol with hydrogen bromide and a dicarboxylic acid having at least 4 carbon atoms in the molecule, in the liquid phase, at a temperature of from about 85° to about 220°C., the water produced in the reactions being removed at such a rate that the weight ratio of hydrogen bromide to water in the reaction mixture is at least about 0.9 until the hydrobromination is substantially complete, at a mole ratio of hydrogen bromide to pentaerythritol of from about 1.8 to 1 to about 2.4 to 1.

3,891,606
CURING WITH COMPLEXES OF SELECTED DIAMINES AND ALKALI METAL SALTS

Irving Charles Kogon, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed July 12, 1973, Ser. No. 378,551
Int. Cl. C08g *22/00*
U.S. Cl. 260—77.5 AM **30 Claims**

1. A process for curing an amino curable polymer or prepolymer which comprises curing said polymer with a curing agent consisting essentially of (a) a source of active hydrogen having one or more Zerewitinoff active hydrogens and an ionization constant such that its pK_a is greater than 6.0, and (b) a complex of 4,4'-methylene dianiline and a salt, the salt being selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, sodium nitrite, lithium chloride, lithium bromide, lithium iodide, lithium nitrite and sodium cyanide, or a complex of racemic 2,3-di(4-aminophenyl)butane with a salt, said salt being selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, potassium chloride, potassium bromide, potassium iodide, rubidium chloride, rubidium bromide, rubidium iodide, cesium chloride, cesium bromide and cesium iodide; the ratio of said dianiline or said butane to said salt in said complex being 3 moles to 1 mole.

3,891,607
PROCESS FOR THE PRODUCTION OF THERMOREVERSIBLE COACERVATES

Rainer Kuhn, Bergisch, Gladbach, and Nikolaus Schon, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 21, 1973, Ser. No. 390,203
Claims priority, application Germany, Dec. 9, 1970, 2060571
Int. Cl. C08f *15/02*
U.S. Cl. 260—80.3 N **4 Claims**

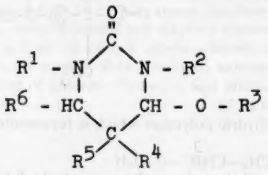
1. A process for the production of a thermoreversible coacervate which comprises copolymerizing from 30 to 50 mol percent of acrylic acid and from 70 to 30 mol percent of acrylamide in aqueous solution in the presence of a free-radical catalyst and in the absence of a water-soluble inorganic salt at a temperature between the coacervate transition temperature and 100°C., lowering the pH-value of the solution either prior to, during or after polymerization to below 3.3 and adjusting the temperature of the solution to below the coacervate transition temperature.

3,891,608
RUBBER MIXTURES SHOWING IMPROVED SURFACE TACK

Harro Petersen, Frankenthal; Paulus Erhard, Weinheim; Hubertus Queins, Friedelsheim, and Hubert Schoeppl, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed July 5, 1974, Ser. No. 485,805
Claims priority, application Germany, July 10, 1973, 2334915
Int. Cl. C08c *1/40*; C08d *1/00*
U.S. Cl. 260—80.78 **1 Claim**

1. Rubber mixtures containing from 1 to 20 parts, based on 100 parts of rubber, of a 2-oxohexahydropyrimidine of the general formula



in which the radicals R^1 to R^6 may be the same or different and each individually denotes hydrogen or alkyl of from 1 to 20 carbon atoms, optionally substituted by further functional groups.

3,891,609
PROCESS TO MINIMIZE YELLOWNESS IN ARTICLES FORMED FROM ACRYLONITRILE-STYRENE COMPOSITIONS

Paul Dillon Wolfe, Wilmington, Del.; Ronald Luther Saxton, West Grove, Pa., and Donald Dean Cameron, Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 2, 1974, Ser. No. 466,308
Int. Cl. C08f *41/12*
U.S. Cl. 260—85.5 HC **5 Claims**

1. In a process for forming a shaped article made from a composition containing a polymer formed from acrylonitrile and styrene, a styrene derivative or combinations thereof, said composition comprising

A. 65 to 100 percent by weight of a polymer consisting essentially of 67 to 85 percent by weight acrylonitrile polymerized units and 33 to 15 percent by weight polymerized units derived from styrene, a styrene derivative, or combinations thereof wherein said styrene derivative is selected from 4-methyl styrene; 4-(t-butyl) styrene; 3-methyl styrene; 2,4-dimethyl styrene; 2,6-dimethyl styrene; 2,4-diisopropyl styrene and α-methyl styrene; and

B. 0 to 35 percent by weight grafted rubber, the grafted rubber consisting essentially of 30 to 50 percent by weight of a graft polymer consisting of 61 to 85 percent by weight acrylonitrile polymerized units and 39 to 15 percent by weight polymerized units of styrene, said styrene derivative or combinations thereof, and 50 to 70 percent by weight rubber;

wherein the shaped article is formed by

1. emulsion polymerizing in the presence of a free radical generator to form said composition;
2. coagulating said composition;
3. melt processing to form a shaped article at a temperature of 200°C. to 260°C.; wherein said improvement comprises

I. coagulating said polymer composition in an environment maintained at a pH of 6.0 to 7.5; and

II. melt processing said polymer composition at:

a. an initial moisture content of 0.2 to 1.5 weight percent and releasing volatiles to yield a shaped article containing a moisture content of 0.15 to 0.4 weight percent immediately prior to solidification or

b. a moisture content of 0.15 to 0.4 weight percent without a substantial release of volatiles;

whereby yellowness is minimized in an essentially bubble free article.

3,891,610
POLYOLEFIN FIBERS AND PROCESS OF FORMATION DURING POLYMERIZATION

Robert W. Fowells, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 874,687, Nov. 6, 1969, abandoned, which is a continuation-in-part of Ser. No. 769,501, Oct. 22, 1968, abandoned. This application Nov. 8, 1972, Ser. No. 304,883

Int. Cl.[2] C08F *210/02, 110/06, 110/02, 4/64*

U.S. Cl. 260—88.2 R **17 Claims**

1. A process of producing fibers of polyolefins having high molecular weight comprising polymerizing a monomeric olefin at an apparent specific reaction rate greater than about 0.05 $sec.^{-1}$ and at a temperature less than the melt dissolution temperature of the polyolefin to be formed in the presence of a coordination catalyst system in a suitable reaction medium whose solubility parameter approaches the solubility parameter of the polyolefin to be formed while subjecting the reaction medium to a shear stress greater than about 0.1 lbs. (force)/sq.ft. to effect formation of a polyolefin in the form of individually separable fibers having a gross morphology and size similar to natural cellulosic papermaking fibers.

3,891,611
PROCESS FOR POLYMERIZING OLEFINS

Toshizo Abe; Seiho Sakamoto; Shigeo Go; Koichi Maekuma; Yoshitaka Yamada, and Yasumasa Hirashima, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed June 25, 1973, Ser. No. 373,254

Claims priority, application Japan, June 24, 1972, 47-63470

Int. Cl. C08f *1/66, 3/02, 15/04*

U.S. Cl. 260—88.2 B **9 Claims**

1. In a process for polymerizing an olefin in the presence of a first catalyst component of chromium oxide on a support and a second catalyst component of an organo-aluminum compound in a hydrocarbon diluent, the improvement which comprises:

adding an aromatic hydrocarbon containing at least four double bonds and a $-CH_2$ group which provides acidic hydrogen atoms within the molecule, as a molecular weight regulator to the reaction mixture, wherein 0.01 –100 ppm of said aromatic hydrocarbon is present in the hydrocarbon diluent.

3,891,612
POLYMERIZED ROSIN PRODUCT AND PROCESS FOR THE PRODUCTION OF SAME

Bernard A. Parkin, Jr., and Walter H. Schuller, both of Lake City, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1973, Ser. No. 337,792

Int. Cl.[2] C08H *11/00;* **C09F** *1/00*

U.S. Cl. 260—99.5 **10 Claims**

1. A process for the production of a polymerized composition which process comprises:

dissolving a material selected from the group consisting of rosin, resin acids and a resin acid in a mixture of acetic acid, sulfuric acid, and water and reacting said material in said mixture, wherein the proportions of acetic acid, sulfuric acid and water in said mixture are such that the unreacted material is soluble and the polymerized products of the reaction have only limited solubility and separate from the mixture in the form of a polymer-rich layer as the reaction proceeds.

3,891,613
PROCESS FOR SEPARATION OF WHOLE WHEAT KERNEL COMPONENTS TO ISOLATE THE GLUTEN EMPLOYING WATER

Ganta V. Rao, and Oliver B. Gerrish, Sr., both of Hutchinson, Kans., assignors to Far-Mar-Co., Inc., Hutchinson, Kans.

Filed Nov. 20, 1972, Ser. No. 307,869

Int. Cl. A23j *1/12*

U.S. Cl. 260—112 G **6 Claims**

1. A process for separating wheat gluten from the nongluten components of the whole wheat kernel comprising the steps of:

a. tempering whole wheat kernels in water to a moisture content, by weight, in the range from 15 to 22%;

b. flaking the whole wheat kernels to a flake thickness in the range from 0.0005 to 0.025 inches;

c. hydrating the flakes in a quantity of water from 65 to 75% by weight of the flakes and agitating the flakes and water to form a thick, dough-like mass; and

d. mechanically working the dough-like mass in the presence of water to wash the non-gluten wheat kernel components from the gluten.

3,891,614
SOLID PHASE SYNTHESIS OF CALCITONINS ON BENZHYDRYLAMINE TYPE RESINS

Kyoichi Sakakibara, Chigasaki; Masaaki Gondoh, Kawasaki; Eiichirou Shimazawa, Sagamihara, and Nobuo Izumiya, Fukuoka, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1973, Ser. No. 421,825

Claims priority, application Japan, Dec. 7, 1972, 47-121973

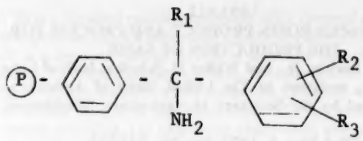
Int. Cl. C07c *103/52;* **C07g** *7/00;* **C08h** *1/00*

U.S. Cl. 260—112.5 **14 Claims**

1. A process for synthesizing calcitonins composed of 32 amino acid units, which comprises

A. bonding a proline residue through an amide linkage to a resin support selected from the group consisting of

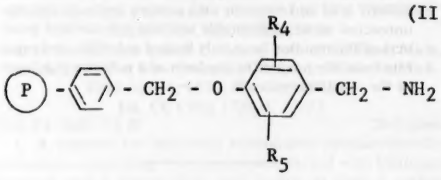
1. Benzohydrylamine containing polymers of the formula



(I)

wherein P represents a styrene-divinylbenzene copolymer, R_1 is a hydrogen atom or lower alkyl group, and R_2 and R_3 are the same or different and each represent a hydrogen atom, a lower alkyl group or a lower alkoxy group,

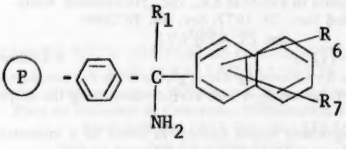
2. p-Methoxybenzylamine containing polymers of the formula



(II)

wherein P is the same as defined in the formula (I), and R_4 and R_5 are the same or different and each represent a hydrogen atom, a lower alkyl group or a lower alkoxy group, and,

3. Naphthyl benzylamine containing polymers of the formula



(III)

wherein P and R_1 are the same as defined in the formula (I), and R_6 and R_7 are the same or different and each represent a hydrogen atom, a lower alkyl group or a lower alkoxy group, B. successively introducing the remaining 31 constituent amino acid residues of calcitonin into the proline residue on the resin support according to the solid phase synthesizing method to form a calcitonin precursor,

C. splitting off the resin support from the calcitonin precursor by treating the calcitonin precursor with anhydrous hydrogen fluoride in the presence of a phenol or a mixture of a phenol and alkyl ether of a phenol, and

D. thereafter oxidizing the resulting dotriacontapeptide with an oxidizing agent selected from air, hydrogen peroxide, iodine or potassium ferricyanide, to bond the mercapto group of the cystein unit at the N terminal to the mercapto group of the cystein unit at the seventh position from the N terminal to form a cyclic disulfide structure.

3,891,615

RECOVERY OF BACITRACIN AS THE CALCIUM OR MAGNESIUM COMPLEX OF AN ALKYLBENZENESULFONIC ACID

Edward B. Hodge, Terre Haute, Ind., and John A. Riddick, Baton Rouge, La., assignors to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Oct. 25, 1973, Ser. No. 409,537

Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*

U.S. Cl. 260—112.5 **11 Claims**

1. An alkaline earth metal-bacitracin-alkylbenzene-sulfonate complex wherein said metal is calcium or magnesium and the alkyl group contains from 10 to 14 carbon atoms.

3,891,616

HYPOTENSIVE β-HOMOAMINOACID NONAPEPTIDES

Miguel Angel Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 17, 1974, Ser. No. 461,669

Int. Cl.² C07C *103/52;* **C07G** *7/00;* **A61K** *37/00*

U.S. Cl. 260—112.5 **3 Claims**

1. A nonapeptide of the formula Arg-A-Pro-Gly-B-Ser-A-B-Arg wherein A is Pro or βH-Pro and B is Phe or βH-Phe, wherein βH-Pro represents β-homoproline and βH-Phe represents β-homophenylanine, provided at least one of A or B is a β-homoaminoacid, all amino acids thereof being of the L-configuration.

3,891,617

METALLIZED AND NON-METALLIZED DIPHENOL METHANE CONTAINING AZO DYESTUFFS

Andre Louis Sailer, and Pierre Frank, both of Saint-Clair du Rhone, France, assignors to Pechiney Ugine Kuhlmann, Paris, France

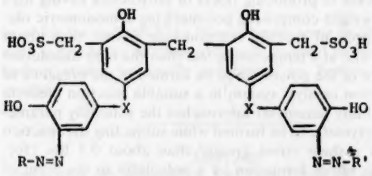
Filed Jan. 26, 1973, Ser. No. 326,728

Claims priority, application United Kingdom, July 23, 1968, 35075/68

Int. Cl. C09b *33/04, 45/28*

U.S. Cl. 260—148 **6 Claims**

1. A dyestuff of the formula



(I)

in which X is $—SO_2—$ or $—C(CH_3)_2—$, and R and R′ are the same or different, and are selected from the group consisting of substituted and unsubstituted phenyl, naphthyl, diphenyl and phenylazophenyl where the substituents are selected from the group consisting of nitro, chloro, sulpho, hydroxy and carboxy.

3,891,618

AZO-DYESTUFFS CONTAINING α,β-DICHLOROPROPIONYLAMINO OR α,β-DIBROMOPROPIONYLAMINO GROUPS

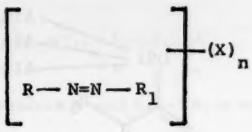
Rene De Montmollin, Richen, and Henri Riat, Arlesheim, both of Sweden, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 876,069, Nov. 12, 1969, Pat. No. 3,755,390, which is a continuation-in-part of Ser. No. 753,829, Oct. 22, 1968, abandoned, which is a continuation of Ser. No. 608,710, Nov. 1, 1966, abandoned, which is a division of Ser. No. 305,539, Aug. 29, 1963, abandoned, which is a continuation-in-part of Ser. No. 731,097, April 28, 1958, abandoned. This application June 1, 1972, Ser. No. 258,774

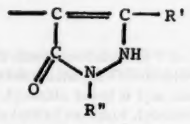
Int. Cl. C09b *62/40, 62/50;* **D06p** *1/38*

U.S. Cl. 260—163 **7 Claims**

1. The 1:2 or 1:1 chromium, cobalt or copper complex of a monoazo dyestuff containing at least 2 and at most 3 sulfonic acid groups which dyestuff corresponds to the formula



wherein R is unsubstituted o-hydroxybenzene, unsubstituted o-hydroxynaphthalene or such groups substituted by lower alkyl, lower alkoxy, trifluoromethyl, chlorine, bromine or sulfo, R_1 is



wherein R′ is methyl or carboxy, R″ is hydrogen, phenyl, sulfophenyl, disulfophenyl, sulfochlorophenyl, sulfodichlorophenyl, sulfonaphthyl, disulfonaphthyl, 2-sulfostilbenyl, or 2,3-tetramethylene-4-sulfophenyl, X is α,β-dichloropropionylamino or α,β-dibromopropionylamino bound to a ring carbon atom of the benzene and naphthalene rings R and R″ and *n* is 1 or 2.

3,891,619
PHENYL-AZO-INDOLE COMPOUNDS

Richard Sommer; Manfred Wiesel; Hans-Günter Otten, and Edgar Siegel, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

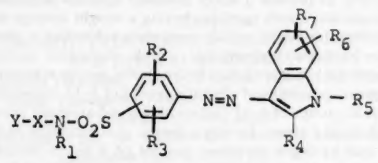
Filed Dec. 1, 1972, Ser. No. 311,414

Claims priority, application Germany, Dec. 2, 1971, 2159802

Int. Cl. C09b *29/36*; **D06p** *3/24*

U.S. Cl. 260—165 **4 Claims**

1. Monoazo dyestuff which in the form of the free acid corresponds to the formula



wherein

R_1 is hydrogen or C_1–C_4-alkyl;

R_2 is hydrogen, chloro, bromo, trifluoromethyl, nitro, cyano, carbonamido, C_1–C_4-alkoxy, C_1–C_4-alkyl, or C_1–C_4-alkyl substituted by chloro, bromo, cyano, carbamoyl, C_1–C_4-alkoxy, or alkoxycarbonyl of 1–4 carbon atoms in the alkoxy portion;

R_3 is hydrogen, chloro, bromo, C_1–C_4-alkoxy, C_1–C_4-alkyl, or C_1–C_4-alkyl substituted by chloro, bromo, cyano, carbamoyl, C_1–C_4-alkoxy, or alkoxycarbonyl of 1–4 carbon atoms in the alkoxy portion;

R_4 is C_1–C_4-alkyl, phenyl, biphenylyl, naphthyl;

R_5 is hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkyl substitued by cyano, amino, carbamoyl, or carboxyl;

R_6 is hydrogen, chloro, bromo, or C_1–C_4-alkyl,

R_7 is hydrogen, chloro, bromo, cyano, C_1–C_4-alkoxy, or C_1–C_4-alkyl;

X is C_2–C_4-alkylene, methylenephenyl, ethylenephenyl, phenylene, or phenylene substituted by C_1–C_4-alkyl, benzyl, phenyl, C_1–C_4-alkoxy, benzyloxy, chloro, bromo, cyano, or nitro;

Y is $-SO_3H$, or when X is phenylene or substituted phenylene, Y is $-SO_3H$ or $-SO_2-NH-SO_2-R_8$; and

R_8 is C_1–C_4-alkyl, phenyl, dimethylamino or C_1–C_4-alkylphenyl.

3,891,620
MODIFIED NATURAL GUMS

Donald R. Cushman, Wenonah, and John W. Schick, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,970

Int. Cl. C08b *19/00, 19/10*

U.S. Cl. 260—209.6 **11 Claims**

1. A process for preparing a modified natural gum which comprises subjecting a natural gum to hydrolysis in the presence of a hydrolyzing agent selected from the group consisting of inorganic acids, alkali metal hydroxides and enzymes in an amount from about 0.1 to about 2 percent, by weight of water present during hydrolysis and at a temperature from about 80°F. to about 212°F.

3,891,621
CARBOHYDRATE-BORON ALKOXIDE COMPOUNDS

Jett C. Arthur, Jr., Metairie, and Malkait S. Bains, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 256,021, May 23, 1972, Pat. No. 3,790,562. This application Oct. 15, 1973, Ser. No. 406,408

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 R **21 Claims**

2. A process for making methyl-alpha-D- glucoside-boron isopropoxide having the empirical formula $[CH_3]\ [C_6H_7O_6]\ [B(OC_3H_7)_2]_4$, the process comprising

a. mixing 8 g of methyl-alpha-D-glucoside with about 25 ml of boron isopropoxide and 100 ml of benzene,

b. refluxing the mixture and removing the isopropanol formed by azeotropic distillation, and

c. removing the remaining volatiles by distilling at 100°C/0.3 torr, to obtain the dry methyl-alpha-D-glucoside-boron isopropoxide.

3,891,622
HEPARIN ESTERS

Jean Mardiguian, and Pierre Fournier, both of Paris, France, assignors to Societe anonyme dite: MAR-PHA, Societe d'Etude et d'Exploitation de Marques, Paris, France

Filed Aug. 14, 1972, Ser. No. 280,175

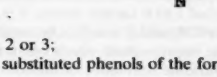
Claims priority, application United Kingdom, Aug. 16, 1971, 38371/71

Int. Cl. C08b *19/03*

U.S. Cl. 260—211 R **14 Claims**

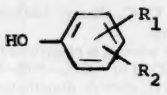
1. A heparin ester in which the carboxyl groups of heparin are esterified, partially or completely, by an alcohol or phenol chosen from the following categories:

A. pyridylalkanols of the formula:



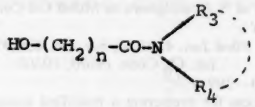
in which *n* is 1, 2 or 3;

B. optionally substituted phenols of the formula:



in which R_1 and R_2 each denote H, NO_2 or COOR where R is H or alkyl of 1 to 4 carbon atoms; and

C. ω-hydroxy-amides of the formula:



in which *n* is 1, 2 or 3, and R_3 and R_4, taken separately, are each alkyl of 1 to 4 carbon atoms, or R_3 and R_4, taken together with the nitrogen atom to which they are attached, form a nitrogen-containing heterocyclic ring with 5 or 6 ring atoms which can contain a second hetero-atom of nitrogen or oxygen.

3,891,623

PROCESS FOR PREPARING CYTIDINES

Helmut Vorbrüggen, and Ulrich Niedballa, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

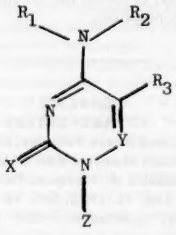
Filed May 3, 1972, Ser. No. 250,045

Claims priority, application Germany, May 4, 1971, 2122991

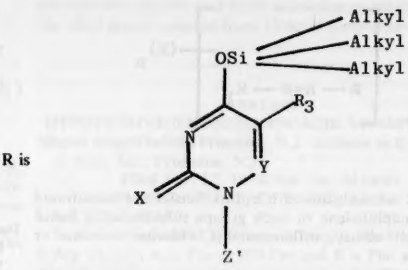
Int. Cl. C07d *51/52*

U.S. Cl. 260—211.5 R **24 Claims**

1. In a process for the preparation of pharmaceutically useful cytidines of the formula



wherein R_1 and R_2 are both hydrogen or alkyl of 1 to 6 carbon atoms; or R_1 is hydrogen and R_2 is hydroxyl, amino, alkyl of 1 to 6 carbon atoms, phenyl or phenyl-lower alkyl optionally ring substituted with hydroxyl or amino, or amino alkyl N-substituted with alkyl of 1 to 4 carbon atoms; or R_1 and R_2, together with the N-atom, collectively represent a heteromonocyclic ring selected from the group consisting of pyrrolidino, 2-methylpyrrolindino, 2,5-dimethylpyrrolindino, 3-ethylpyrrolindino, piperindino, homopiperidino, morpholino, imidazolyl, triazolyl, piperazino, indolyl and anilino; R_3 is hydrogen, halogen or alkyl of 1 to 6 carbon atoms; X is oxygen or sulfur; Y is nitrogen or CH; and Z is a free or masked monosaccharide residue, the improvement which comprises reacting a 4-trialkyl-silyloxyuridine derivative of the formula



wherein Alkyl is of 1 to 3 carbon atoms, Z′ is a hydrolyzable silylated, or hydrolyzable O-acylated masked monosaccharide residue Z, wherein acyl is lower alkanoyl, benzoyl, p-chlorobenzoyl, p-nitrobenzoyl, touyl, or benzyl and R_3, X, Y and Z have the above-indicated meanings, with ammonia or with a primary or secondary amine of the formula H N R_1 R_2, or with a salt of said primary or secondary amine in the presence of 1 to 5 moles of a tertiary amine per mole of amine salt to form said cytidine.

3,891,624

PREPARATION OF REDISPERSIBLE HYDROPHOBIC STARCH DERIVATIVES

Douwe Johannes Boonstra, Veendam, and Frans Berkhout, Vries, both of Netherlands, assignors to Scholten-Honig Research N.V., Netherlands

Filed July 9, 1971, Ser. No. 161,922

Claims priority, application United Kingdom, July 14, 1970, 33990/70

Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R **9 Claims**

1. A process for the manufacture of dry hydrophobic starch derivatives which are dispersible as subgranule particles in water at a temperature ranging from ambient temperature up to 100°C to provide a stable colloidal aqueous suspension of hydrophobic starch particles having a weight average size of less than 1 micron, which comprises subjecting a granular water-insoluble hydrophobic starch derivative containing ether-linked or ester-linked hydrophobic groups selected from the group consisting of aliphatic groups of 3–17 carbon atoms, alicyclic groups of 6–12 carbon atoms and aromatic groups of 6–12 carbon atoms, having a degree of substitution of 0.1 to 1.0 and having a moisture content of 4 to 15 percent, to mechanical shear and compression at a pressure of from 10 atm. to 250 atm. with attendant heating to temperatures in the range of 100°C to 250°C, forcing the resultant mass through a die and discharging said mass from said die, said discharge from said die being accompanied by a sudden release of pressure to atmospheric pressure, whereby said hydrophobic starch derivative is expanded to a porous mass consisting of fragmented granules.

3,891,625

TERTIARY PERFLUORO-AMINO ETHERS

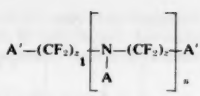
Siegfried Benninger, Schwalbach, Taunus, and Siegfried Rebsdat, Neuotting, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 9, 1973, Ser. No. 386,856

Int. Cl. C07d *51/70*

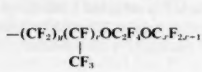
U.S. Cl. 260—239 A **24 Claims**

1. A compound of the formula

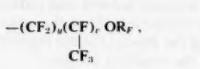


where the radicals A′ each are —NA_2 or together form the radical

from 0 to 2 radicals A each represent



from 0 to 2 radicals A each represent R_F.
all other radicals A, but at least one, each represent



R_F is a linear perfluoro-alkyl radical having from one to three carbon atoms,
z_1 is an integer of from 1 to 6,
z represents the same or different integers of from 1 to 6,
n is 0, 1, 2, 3, 4, 5 or 6,
y is 1, 2 or 3,
v is 0 or 1 and
x is 2 or 3.

3,891,626
1-SUBSTITUTED BENZO(B) AZOCINE DERIVATIVES AND THEIR ACID ADDITION SALTS

Tadashi Okamoto, Ashiya; Tsuyoshi Kobayashi, Minoo, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Japan

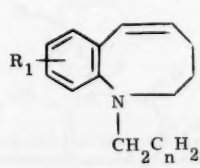
Division of Ser. No. 80,801, Oct. 14, 1970, abandoned. This application Nov. 1, 1973, Ser. No. 411,922

Claims priority, application Japan, Apr. 30, 1970, 45-37361; Apr. 30, 1970, 45-37362; May 18, 1970, 45-42636; May 27, 1970, 45-45920

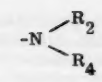
Int. Cl. C07d *41/00, 57/00, 87/83*

U.S. Cl. 260—239 BB **18 Claims**

1. A 1-substituted benzo[b]azocine derivative of the formula:



wherein R_1 is a hydrogen atom or halogen atom, A_2 is a piperidino group, a morpholino group or a group of the formula:



wherein R_2 is a hydrogen atom or a lower alkyl group and R_4 is a hydrogen atom or a lower alkyl group and n is an integer from 1 to 3, and pharmaceutically acceptable additional salts thereof.

3,891,627
6-(ALPHA-[AMIDINOTHIOACYLAMIDO)ACYLAMIDO]-PENICILLANIC ACIDS

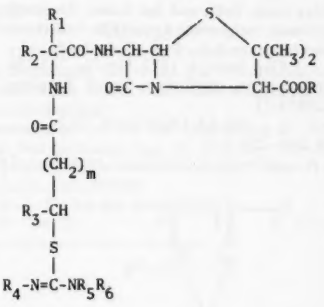
Robert L. Rosati, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 18, 1972, Ser. No. 254,524

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **12 Claims**

1. A compound of the formula



and the pharmaceutically-acceptable metal and amine salts thereof wherein

R is selected from the group consisting of hydrogen and acyloxy lower alkyl wherein acyloxy is selected from the group consisting of lower alkanoyloxy, benzoyloxy and substituted benzoyloxy wherein the substituent is selected from the group consisting of chloro, bromo, fluoro, lower alkyl, lower alkoxy and trifluoromethyl;

R_1 is selected from the group consisting of hydrogen, alkyl of from 1 to 6 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, 1,4-cyclohexadienyl, 2,4,6-cycloheptatrienyl, naphthyl, benzyl, phenethyl, indolylmethyl, furyl, thienyl and

wherein

Y is selected from the group consisting of hydrogen, nitro, di(lower alkyl)amino, lower alkanoylamino, lower alkyl, lower alkoxy, hydroxy, sulfamyl, chloro, bromo, fluoro, iodo and trifluoromethyl;

R_2 is selected from the group consisting of hydrogen and lower alkyl;

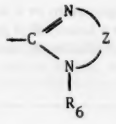
R_1 and R_2 when taken together with the carbon atom to which they are attached are cycloalkylidene of 3 to 10 carbon atoms;

R_3 is selected from the group consisting of hydrogen and methyl;

each of R_5 and R_6 is selected from the group consisting of hydrogen and lower alkyl;

R_4 is selected from the group consisting of hydrogen, lower alkyl, carboxymethyl, carbamoylmethyl and amidino;

R_4 and R_5 when taken together with the amidino group to which they are attached form a heterocyclic ring of the formula



wherein

Z is selected from the group consisting of —N=CH—, alkylene of from 2 to 5 carbon atoms, —C(O)—CH=CH— and —CH_2—C(O)—; and

m is 0 or 1.

3,891,628

PROCESS FOR PREPARING PENICILLINS

Peter Max Smid, Delft, and Jan Kalter, Zevenhuizen, both of Netherlands, assignors to Koninklijke Nederlandsche Gist-en Spiritusfabrieken N.V., Delft, Netherlands

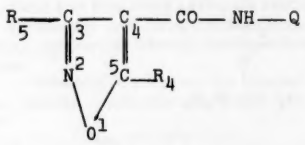
Filed June 14, 1972, Ser. No. 262,786

Claims priority, application United Kingdom, June 15, 1971, 28075/71

Int. Cl. C07d *99/16, 99/24*

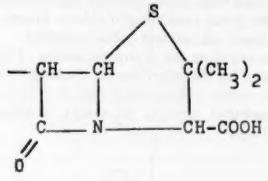
U.S. Cl. 260—239.1 **5 Claims**

1. A process for the preparation of penicillins of the formula



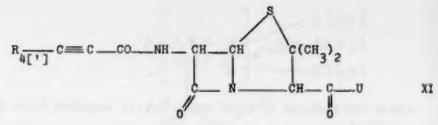
VII

wherein Q is a penicillanic acid group of the formula



IX

wherein R_4 is selected from the group consisting of hydrogen, lower alkyl optionally substituted, phenyl optionally substituted, lower alkoxy, benzyl optionally substituted on the phenyl ring, cycloalkyl of 5 to 8 carbon atoms optionally substituted and carboxy and esterified carboxy, said optional substituents being selected from the group consisting of hydroxy, lower alkoxy, carboxy, alkoxycarbonyl, halogen and diloweralkylamino and R_5 is phenyl optionally carrying at least one substituent selected from the group consisting of lower alkyl, lower alkoxy, di(lower)alkylamino, nitro and halogen, or R_5 is a tertiary lower alkyl or adamantyl, which comprises reacting a compound of the formula



XI

wherein U is selected from the group consisting of hydroxy, imido and OE in which E is selected from the group consisting of a silyl, benzyl, benzhydryl, 2,2,2-trichloroethyl and optionally halosubstituted phenacyl with a nitrile oxide of the formula

XIII

wherein R_5 has the above definition in the presence of at least one aprotic dipolar organic solvent and optional amounts of hexamethylphosphontriamide to form the corresponding isoxazole and converting the group U in the resulting product into a hydroxy group in the resulting product.

3,891,629

PROCESS FOR THE PREPARATION OF 6-[D-2-AMINO-2(1,4-CYCLO-HEXADIENYL-) ACETAMIDO] PENICILLANIC ACID

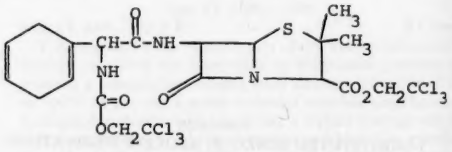
Patrick Andrew Diassi, Westfield, N.J., and Manmohan Singh Atwal, New York, N.Y., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 16, 1973, Ser. No. 333,264

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **4 Claims**

1. A compound of the formula



3,891,630

SUBSTITUTED PYRAZOLO[3,4-E][1,4]THIAZEPINES AND ISOXAZOLO[5,4-E][1,4]THIAZEPINES

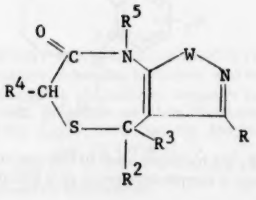
Leo Ralph Swett, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 4, 1974, Ser. No. 448,086

Int. Cl. C07d *99/10, 99/00*

U.S. Cl. 260—239.3 B **11 Claims**

1. The process of preparing an isoxazolo[5,4-e]-[1,4]- or a pyrazolo[3,4-e] [1,4]thiazepinone of the formula:

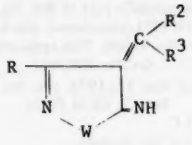


I

wherein W is >O or >N-R¹, and wherein R is hydrogen, lower-alkyl or phenyl, R¹ is hydrogen, loweralkyl, phenyl or cyclohexyl, R² is loweralkyl, cyclopropyl, 2-furyl or

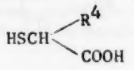
II

wherein X is hydrogen, halogen, trifluoromethyl, hydroxy, loweralkoxy or dimethylamino and Y is hydrogen, chlorine or loweralkoxy, R³ is hydrogen or loweralkyl, R⁴ is hydrogen, loweralkyl or carboxyloweralkyl and R⁵ is hydrogen, consisting essentially in condensing a compound of the formula:



III

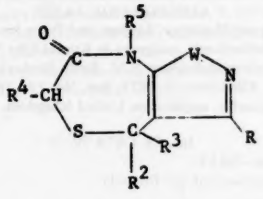
wherein W, R, R² and R³ have the above meanin with a thioglycolic acid of the formula:



IV

wherein R⁴ has the above meaning, in the presence of an inert solvent boiling above 50° C. at a temperature between 60° and 150° C. for a period of at least 30 minutes.

5. A substituted pyrazolo[3,4-e] [1,4]thiazepinone or an isoxazolo[5,4-e] [1,4]thiazepinone of the formula:



I

wherein W is >O or >NR¹, R is hydrogen, loweralkyl or phenyl, R¹ is hydrogen, loweralkyl, phenyl or cyclohexyl, R² is lower-alkyl, cyclopropyl, 2-furyl or

II

wherein X is hydrogen, halogen, trifluoromethyl, hydroxy, loweralkoxy or dimethylamino and Y is hydrogen, chlorine or loweralkoxy, R³ is hydrogen or loweralkyl, R⁴ is hydrogen, loweralkyl or carboxyloweralkyl and R⁵ is hydrogen, loweralkyl or diloweralkylaminoloweralkyl.

3,891,631

PROCESS FOR PREPARING 17α-MONOESTERS OF 17α, 21-DIHYDROXY-20-OXO STEROIDS

Gordon Hanley Phillipps, Wembley; Brian MacDonald Bain, Chalfont St. Peter, and Graham Durrant, London, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Aug. 10, 1973, Ser. No. 387,487

Claims priority, application United Kingdom, Aug. 11, 1972, 37655/72

Int. Cl.² C07C *173/00*

U.S. Cl. 260—239.55 R **23 Claims**

1. A process for the preparation of 17α-carboxylate or neutral phosphate or carbonate esters of 17α,21-dihydroxy-20-oxo-steroids which comprises reacting a 21-carboxylate or neutral phosphate or carbonate ester of a 17α,21-dihydroxy-20-oxo-steroid with a non-hydroxylic base in an anhydrous aprotic medium to remove a proton selectively from the 17α-hydroxyl grouping without elimination of the 17α-oxygen function, and subsequently neutralising or acidifying the reaction mixture whereby the intermediate product is protonated to produce the desired 17α-ester.

3,891,632

TRIAZOLYLSTYRYL COMPOUNDS

Fritz Fleck, Bottmingen, Basel Land, and Hans Rudolf Schmid, Riehen, Basel Stodt, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

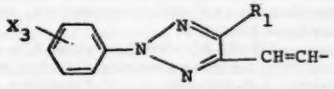
Continuation-in-part of Ser. No. 41,055, May 27, 1970, abandoned. This application Mar. 28, 1973, Ser. No. 345,677

Claims priority, application Switzerland, June 6, 1969, 8647/69; June 11, 1969, 8889/69

Int. Cl. C09b *23/14*

U.S. Cl. 260—240 D **12 Claims**

1. A triazolyl compound of formula



where

R_1 stands for hydrogen; alkyl with 1–6 carbon atoms, which may bear as substituents hydroxy, halogen or alkoxy with 1–6 carbon atoms; or phenyl, which may bear as substituents halogen, nitrile, alkyl or alkoxy with 1–6 carbon atoms, phenyl, the sulphonic or carboxylic group or the sulphonic or carboxylic amide group,

R_2 stands for a phenyl or naphthyl radical, which may be substituted,

X_3 stands for hydrogen, halogen or alkyl or alkoxy with 1–6 carbon atoms

and the ring B may bear a substituent,

provided that the substituents of the ring B and of phenyl radicals occurring in R_2 are alkyl or alkoxy with 1–6 carbon atoms; halogen; nitrile; unsubstituted or substituted phenyl or phenoxy; carboxylic or sulphonic acid; carboxylic or sulphonic acid phenyl, substituted phenyl or optionally substituted alkyl (C_{1-6}) ester; carboxylic or sulphonic acid amide; optionally substituted phenylsulphonyl; or alkylsulphonyl with 1–6 carbon atoms; where alkyl may bear as substituents hydroxy, halogen or alkoxy with 1–6 carbon atoms and phenyl and phenoxy may bear as substituents alkyl (C_{1-6}), alkoxy (C_{1-6}) or halogen; and wherein the amides are derived from amines of formula

where

R′ stands for hydrogen, alkyl with 1–6 carbon atoms, hydroxyalkyl with 2–4 carbon atoms, alkoxyalkyl with 3–6 carbon atoms, phenyl, methylphenyl, halogenphenyl, methoxyphenyl or phenylalkyl where alkyl is of 1–6 carbon atoms

and R″ stands for hydrogen, alkyl with 1–6 carbon atoms or hydroxyalkyl with 2–4 carbon atoms.

3,891,633

METHOD OF PRODUCING DIANHYDRIDES OF AROMATIC TETRACARBOXYLIC ACIDS

Alfred Anisimovich Berlin, Leninsky prospekt, 57, kv. 9; Boris Izrailevich Liogonky, ulitsa 26 Bakinskikh Komissarov, 7, korpus 4, kv. 45, and Boris Isaakovich Zapadinsky, prospekt Vernadskogo, II/19, kv. 221, all of Moscow, U.S.S.R.

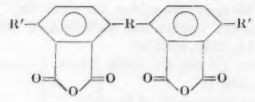
Continuation of Ser. No. 102,911, Dec. 30, 1970, abandoned. This application Sept. 17, 1973, Ser. No. 397,736

Claims priority, application U.S.S.R., Jan. 7, 1970, 1386176; 1386177; 1386178; 1386182; 1386186

Int. Cl. C07c *63/18*

U.S. Cl. 260—240 G **14 Claims**

1. A dianhydride of aromatic tetracarboxylic acids, of the formula:

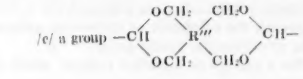


where R is

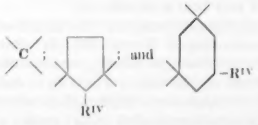
a. arylene selected from the group consisting of p-phenylene, m-phenylene, 4,4′-diphenylene, 3,3′-dimethyl-4,4′-diphenylene, 4,4′-diphenylenoxide, 4,4′-diphenylene, -diphenylenoxide, 4,4′-diphenylene-methane, and 4,4-diphenylenesulphone;

b. a group —CH=N—R″—N=CH—, where R″is arylene selected from the group consisting of p-phenylene, m-phenylene, 4,4′-diphenylene, 3,3′-diphenylene, 3,3′-dimethyl-4,4′-diphenylene, 3,3′-dimethoxy-4,4′-diphenylene, 4,4′-diphenylenoxide, 4,4′-diphenylenemethane, 4,4′-diphenylenesulphone, 4,4′-diphenylenesulphide, 1,4-napthylene, 1,5-naphthylene, 2,6-naphthylene, 2,7-naphthylene, and 1,4-anthrylene;

c. a group



where R‴ is selected from the group consisting of



where R^{IV} is selected from the group consisting of H, OH, and =O; or

d. a group $-CH_2OCO-R^{V}-COOCH_2-$, where R^{V} is selected from the group consisting of p-phenylene, m-phenylene, 4,4′-diphenylene, 1,4-naphthylene, 1,5-naphthylene, 2,6-naphthylene, and 2,7-naphthylene; and

R′ is selected from the group consisting of hydrogen, phenyl, and naphthyl with the proviso that when R is p**1phenylene** or m-phenylene, R′ is selected from the group p-phenylene of phenyl and naphthyl.

3,891,634

P-HYDROXYMETHYLPHENYLACETAMIDOCEPHALOSPORINS

George L. Dunn, Wayne, and John R. E. Hoover, Philadelphia, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

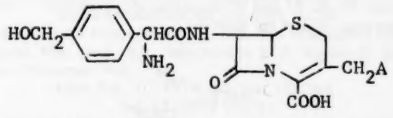
Continuation-in-part of Ser. No. 262,903, June 14, 1972, and a continuation-in-part of Ser. No. 289,499, Sept. 15, 1972, said Ser. No. 262,903, is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned, said Ser. No. 289,499, is a continuation-in-part of Ser. No. 262,903 and Ser. No. 116,599, Feb. 18, 1971, abandoned, which is a continuation-in-part of said Ser. No. 99,296. This application May 11, 1973, Ser. No. 359,566

application May 11, 1973, Ser. No. 359,566

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **4 Claims**

1. A compound of the formula:



where A is monocyclic heterocyclic thio selected from the group consisting of 1,2,3-triazolyl, 1,2,4-triazolyl, 1,3,4-thiadiazolyl, 1,3,4-oxadiazolyl, or tetrazolyl, each such heterocyclic group being unsubstituted or substituted with methyl, or a pharmaceutically acceptable salt thereof.

3,891,635

7-[3-(PHENYL)-ISOXAZOL-5-YL]ACETAMIDO-CEPHALOSPORANIC ACIDS

Peter Wolfgang Henniger, Leiden, and Peter Max Smid, Delft, both of Netherlands, assignors to Koninklijke Nederlandsche Gist-en Spiritusfabrieken N.V., Delft, Netherlands

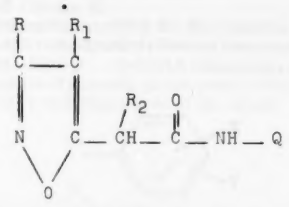
Filed Nov. 3, 1971, Ser. No. 195,482

Claims priority, application United Kingdom, Nov. 6, 1970, 53040/70

Int. Cl. C07d *99/24*

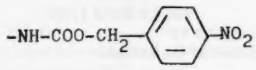
U.S. Cl. 260—243 C **10 Claims**

1. A compound of the formula

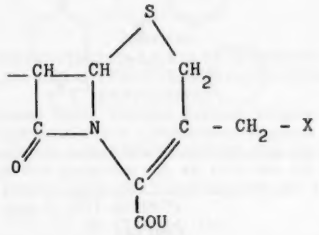


wherein R is selected from the group consisting of mono aminophenyl, mononitro phenyl, phenyl and phenyl substituted with one to three members of the group consisting of chlorine, fluorine, and lower alkyl of 1 to 4 carbon atoms, R_1 is selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms, cyano amino,

and chlorine, R_2 is selected from the group consisting of hydrogen, amino, lower alkyl of 1 to 4 carbon atoms, bromo, chloro and



and Q is



X is selected from the group consisting of hydrogen, hydroxy and lower alkanoyloxy and U is OY, wherein Y is selected from the group consisting of hydrogen, non-toxic pharmaceutically acceptable salt forming groups and alkyl of 1 to 4 carbon atoms.

3,891,636

10-(PIPERIDINO-ALKYL) -PHENOTHIAZINES

Pierre Henri Deriu'e, Le Perreux, and Jean-Paul Lavaux, Paris, both of France, assignors to Roussel Uclaf, Paris, France

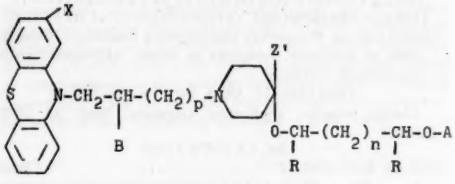
Continuation-in-part of Ser. No. 252,461, May 11, 1972, abandoned. This application Oct. 19, 1973, Ser. No. 407,995

Claims priority, application France, Nov. 9, 1972, 72.39673

Int. Cl. C07d *279/26, 279/28*

U.S. Cl. 260—243 A **24 Claims**

1. A compound selected from the group consisting of 10-(piperidino-alkyl)-phenothiazines of the formula



wherein X is selected from the group consisting of hydrogen, chlorine, $-CF_3$, $-OCH_3$ and $-SCH_3$, B and R are individually selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, Z' is selected from the group consisting of hydrogen and alkyl of 1 to 10 carbon atoms, *p* is 0 or 1, *n* is 0, 1 or 2 and A is selected from the group consisting of hydrogen, $-COOR_2$ and $-COR_1$, R_2 is linear alkyl of 1 to 15 carbon atoms and R_1 is selected from the group consisting of alkyl, alkoxyalkyl and alkenyl of 1 to 18 carbon atoms and 3,4,5-trimethoxyphenyl and their non-toxic, pharmaceutically acceptable acid addition salts.

3,891,637

PROCESS FOR THE PRODUCTION OF CARBOXAMIDES OF OXO-1,2-BENZOTHIAZINE-1,1-DIOXIDES

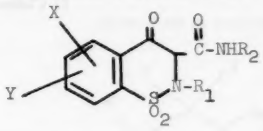
Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 1, 1974, Ser. No. 510,892

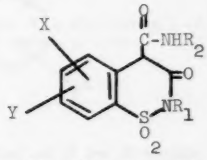
Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **10 Claims**

1. A process for preparing a 3,4-dihydro-2H-1,2-benzothiazine 1,1-dioxide of the formula:



or

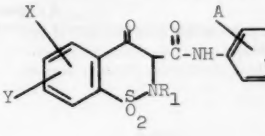


wherein X and Y each are selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, trifluoromethyl, and alkyl and alkoxy of up to five carbon atoms;

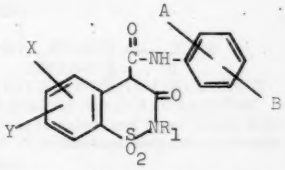
R_1 is a member selected from the group consisting of hydrogen, lower alkyl and alkenyl of up to four carbon atoms and phenyl alkyl of up to three carbon atoms in the alkyl moiety,

and R_2 is a member selected from the group consisting of 2-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6-dimethyl-2-pyridyl, 5-chloro-2-pyridyl, 5-bromo-2-pyridyl, 5-nitro-2-pyridyl, 3-hydroxy-2-pyridyl, 5-carboxamido-2-pyridyl, 2-pyrazinyl, 2-pyrimidyl, 4,5-dimethyl-2-pyrimidyl, 4-pyrimidyl, 5-methyl-3-pyrazinyl, 6-methoxy-3-pyridazinyl, 1-phenyl-3-pyrazolonyl, 2-thiazolyl, 4-methyl-2-thiazolyl, 4-phenyl-2-thiazolyl, 5-bromo-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 3-isothiazolyl, 2-benzothiazolyl, 6-methyl-2-benzothiazolyl, 4-chloro-2-benzothiazolyl, 6-bromo-2-benzothiazolyl, 5-chloro-2-benzoxazolyl, 1,3,4-thiadiazolyl, 5-methyl-1,2,4-thiadiazolyl, 5-methyl-1,3,4-thiadiazolyl, 1,2,4-triazolyl and 6-phenyl-1,2,4-triazolyl;

which comprises contacting a corresponding carboxanilide compound of the formulae:



and



wherein A and B are each selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, trifluoromethyl and alkyl and alkoxy of up to three carbon atoms, with at least a substantially equimolar portion of an amine of the formula R_2NH_2 wherein R_2 is as previously defined in reaction-inert organic solvent medium at a temperature between about 75°C. and about 200°C. until the reaction is substantially complete.

3,891,638

FUSED QUINAZOLINONES

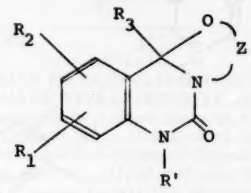
Shigeho Inaba, Takarazuka; Michihiro Yamamoto, Toyonaka; Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe; Masao Koshiba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 172,562, Aug. 17, 1971, abandoned. This application July 23, 1973, Ser. No. 381,571

Int. Cl. C07d *87/20*

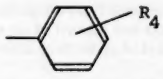
U.S. Cl. 260—244 R 21 Claims

1. A quinazolinone derivative of the formula,



(I-a)

wherein R_1 and R_2 are individually a hydrogen atom, a C_{1-4} alkyl group, a C_{1-4} alkoxy group, a nitro group, a C_{1-4} alkylsulfonyl group or a halogen atom; R_3 is a pyridyl group, a thienyl group or a group of the formula



wherein R_4 is a hydrogen atom or a halogen atom; Z is ethylene or propylene, and R' is aralkyl selected from the group consisting of benzyl, phenethyl, methoxybenzyl, chlorobenzyl and fluorobenzyl.

3,891,639

4-[(3-AMINO-2-ACYLOXYPROPOXY]-1,2,5-THIADIAZOLE COMPOUNDS

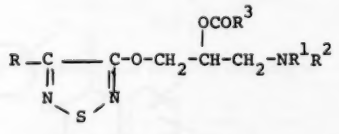
Burton Kendall Wasson, Valois, Canada, assignor to Merck Sharp & Dohme (I.A.) Corporation, Rahway, N.J.

Filed Apr. 19, 1973, Ser. No. 352,765

Int. Cl. C07d *91/54*

U.S. Cl. 260—247.1 H 8 Claims

1. A racemic product or an optically active isomer thereof having the structure



or an acid addition salt thereof wherein R represents morpholino, piperidino and hydroxypiperidino R^1 represents hydrogen and C_{1-3} alkyl; R^2 represents C_{1-10} alkyl, hydroxy C_{1-10} alkyl, lower alkenyl, lower alkynyl; the radical NR^1R^2 can represent morpholino; and R^3 represents a mono- or polysubstituted lower alkyl wherein the alkyl group contains from 2 to 6 carbons and the substituent groups are selected from halogen, a phenyl, phenoxy or carboxy.

3,891,640

APOVINCAMINIC ACID AMINES AND ACID ADDITION SALTS THEREOF

Michel Marie Penee Plat; Monique Plat, nee Berry, both of Antony; Jean Cahn, Montrouge, and Pierre Georges Christian Tisseyre, Alencon, all of France, assignors to Synthelabo, France

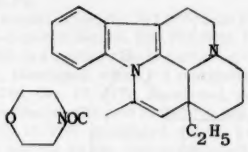
Filed Mar. 22, 1973, Ser. No. 343,681

Claims priority, application France, Mar. 22, 1972, 72.09951

Int. Cl. C07d *57/06*

U.S. Cl. 260—247.5 FP 2 Claims

1. A compound of the formula



and the non-toxic addition salts thereof.

3,891,641

3-AMINOALCOXY-6-HYDRAZINO PYRIDAZINES

Giorgio Pifferi, Milan, Italy, assignor to I. S. F. S.p.A., Milan, Italy

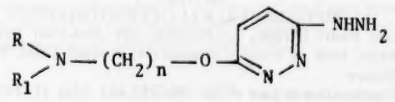
Filed Jan. 17, 1972, Ser. No. 218,531

Claims priority, application Italy, May 29, 1971, 25230/71

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 4 Claims

1. A compound of the formula:



wherein *n* is an integer from 2 to 3, R is hydrogen, methyl or ethyl and R_1 is methyl, ethyl or phenyl or its pharmaceutically acceptable acid addition salts.

3,891,642

O-ALKYL-O-6(P-HALOPHENYL)-PYRIDAZINYL-(3)-THIONO-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Walter Lorenz, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

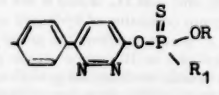
Filed Mar. 14, 1973, Ser. No. 341,189

Claims priority, application Germany, Mar. 23, 1972, 2214059

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 AP 7 Claims

1. An O-alkyl-O-6-[p-halogenophenyl]-pyridazinyl-[3]thionophosphoric(phosphonic) acid ester of the formula



(I)

in which

R is alkyl of 1 to 6 carbon atoms,

R_1 is alkyl or alkoxy of 1 to 6 carbon atoms or phenyl, and

Hal is chlorine and bromine.

3,891,643
PYRROLO([1,2,3-DE)QUINOXALIN-2-(3H])-ONES AND RELATED COMPOUNDS

John H. Sellstedt, Pottstown, and Milton Wolf, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 252,990, May 15, 1972, Pat. No. 3,813,392, which is a division of Ser. No. 831,723, June 9, 1969, abandoned. This application Jan. 25, 1974, Ser. No. 436,570

Int. Cl. C07d *57/24*

U.S. Cl. 260—250 Q 1 Claim

1. 7,8,9,10-tetrahydro-8-methyl-1H-pyrido[3',4':4,5]pyrrolo[1,2,3-de]quinoxalin-2(3H)-one.

3,891,644
10,10-DISUBSTITUTED-2,3,4,10-TETRAHYDRO-AND 1,2,3,4,10A-HEXAHYDROPYRIMIDOL [1,2-A]INDOLE DERIVATIVES

Alan Chapman White, Windsor, England, assignor to John Wyeth and Brother (Ltd.), Maidenhead, England

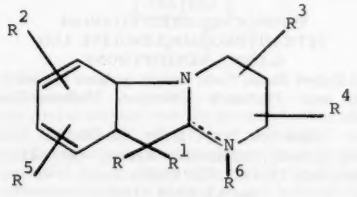
Continuation-in-part of Ser. No. 211,105, Dec. 22, 1971, abandoned. This application May 18, 1973, Ser. No. 361,701

Claims priority, application United Kingdom, Jan. 11, 1971, 1250/71; Sept. 2, 1971, 40959/71

Int. Cl. C07d *51/46*

U.S. Cl. 260—251 A 12 Claims

1. A compound selected from the group consisted of indole derivatives having the formula:



the methiodides thereof and the acid addition salts thereof with pharmaceutically acceptable acids, in which R represents hydroxyl, acetoxy, propionoxy or butyryloxy, R^1 represents a member of the group consisting of phenyl, lower alkyl, lower alkynyl, benzyl, naphthyl, thienyl, pyridyl, monohalophenyl, dihalophenyl, lower alkyl phenyl, di(lower alkyl)phenyl, lower alkoxyphenyl, and trifluoromethylphenyl, R^2 and R^5 (which may be the same or different) represent hydrogen, halogen or lower alkoxy, R^3 and R^4 (which may be the same or different) represent hydrogen or lower alkyl, the dotted line represents an optional bond in the position indicated, and R^6, which is present only when the optional bond represented by the dotted line is absent, represents hydrogen or lower alkyl.

3,891,645
PYRIMIDYL-ANTHRAQUINONE DYES

Trevor James Smith, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

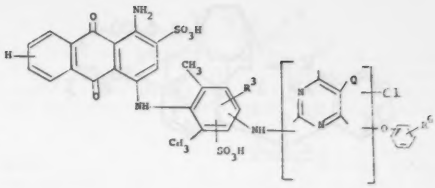
Division of Ser. No. 183,637, Sept. 24, 1971, Pat. No. 3,763,159. This application May 22, 1973, Ser. No. 362,921

Claims priority, application United Kingdom, Oct. 15, 1970, 49061/70

Int. Cl. C07d *51/36*

U.S. Cl. 260—256.5 R 1 Claim

1. A water soluble anthraquinone dye having the formula:



wherein R^3 is hydrogen or methyl, R^6 is alkyl having 2–15 carbon atoms and Q is hydrogen, chlorine or cyano.

3,891,646
5-(2-AMINOETHYL)-2,3-DIOXOPIPERAZINES

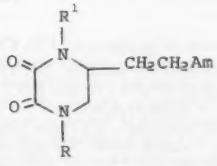
Carl Dalton Lunsford, Richmond, and Albert Duncan Cale, Jr., Mechanicsville, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 32,346, April 24, 1970, abandoned. This application Feb. 29, 1972, Ser. No. 230,460

Int. Cl. C07d *51/72*

U.S. Cl. 260—268 DK 5 Claims

1. A compound selected from 5-(2-aminoethyl)-2,3-dioxopiperazines having the formula:



wherein;

R is selected from the group consisting of lower-alkyl and cyclohexyl,

R^1 is phenyl,

Am is selected from the group consisting of methylamino, isopropylamino and dimethylamino and

pharmaceutically acceptable acid addition salts thereof.

3,891,647
2-TRIFLUOROMETHYL-SULPHONYL-11-SUBSTITUTED-PIPERAZINYL-DIBENZ [B,F][1,4] OXAZEPINE

Jean Schmutz, Muri; Fritz Hunziker, and Franz Martin Künzle, both of Bern, all of Switzerland, assignors to Wander Ltd., Bern, Switzerland

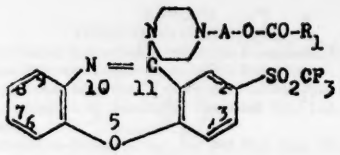
Continuation-in-part of Ser. No. 166,997, July 28, 1971, abandoned. This application Jan. 23, 1973, Ser. No. 326,121

Claims priority, application Switzerland, Aug. 6, 1970, 11922/70; June 1, 1971, 07915/71; June 6, 1972, 08441/72; Oct. 20, 1972, 15415/72; Oct. 20, 1972, 15416/72

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 TR 14 Claims

1. A compound of the formula:



wherein

A is alkylene of 1 to 3 carbon atoms, and

R_1 is alkyl of 3 to 18 carbon atoms or alkenyl of 3 to 18 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

3,891,648

2-[(1,4-BENZODIOXAN)-2-YL]-ACETAMIDINES

Marcell Descamps, Crainhem, and Alex Areschka, Brussels, both of Belgium, assignors to Labaz, Paris, France

Filed May 14, 1973, Ser. No. 360,142

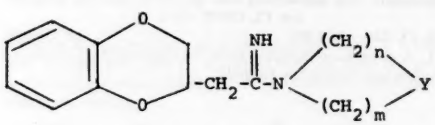
Claims priority, application United Kingdom, June 1, 1972, 25697/72

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 BC **3 Claims**

1. A compound of the formula:

I



wherein Y represents an oxygen atom, CH_2, CH—CH_3, NH or NR wherein R is branched- or straight-chain lower alkyl containing 1–4 carbon atoms, lower hydroxyalkyl containing 1–4 carbon atoms, carbethoxy, phenyl, chlorophenyl, fluorophenyl, trifluoromethylphenyl, benzyl, or pyridyl, *n* represents an integer from 1 to 3 and *m* represents one of the integers 2 and 3, and the pharmaceutically acceptable acid addition salts thereof.

3,891,649

1,4-DICHLORO-2,2,5,5-TETRASUBSTITUTED-3,6-PIPERAZINEDIONES

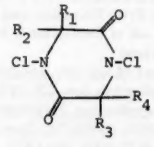
Nicolae S. Bodor, and James J. Kaminski, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Apr. 1, 1974, Ser. No. 456,743

Int. Cl.[2] **C07D** *51/72*

U.S. Cl. 260—268 DK **6 Claims**

1. A compound having the following formula:



wherein R_1, R_2, R_3 and R_4 are the same or different, and represent alkyl of from 1 to 20 carbon atoms, phenyl or naphthyl.

3,891,650

PROCESS FOR PREPARING ANTHRAQUINONE-1-ACETIC ACID AND ESTERS THEREOF

Giuseppe Ribaldone, Gallarate, and Giampietro Borsotti, Novara, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed May 9, 1973, Ser. No. 358,725

Claims priority, application Italy, May 10, 1972, 24170/72

Int. Cl. C09b *1/00*

U.S. Cl. 260—376 **3 Claims**

1. Process for the preparation of anthraquinone-1-acetic acid and esters thereof, characterized in that an anthraquinone-1-diazonium sulphate is reacted with 1,1-dichloroethylene in the presence of cuprous salts and H_2O or alkanols containing from 1 to 5 carbon atoms, at temperatures between 25° and 35°C, at atmospheric pressure and after the removal of any unreacted 1,1-dichloroethylene, the anthraquinone-1-acetic acid or ester thereof is separated from the reaction medium in solid form.

3,891,651

COMPOUNDS DERIVED FROM TETRAHYDRO-ISOQUINOLINE AND GAMMA-BENZOPYRONE

Rolland Robert Blaise, Paris, France, assignor to Societe Anonyme pour l'Industrie Chimique, Mulhouse-Dornach, France

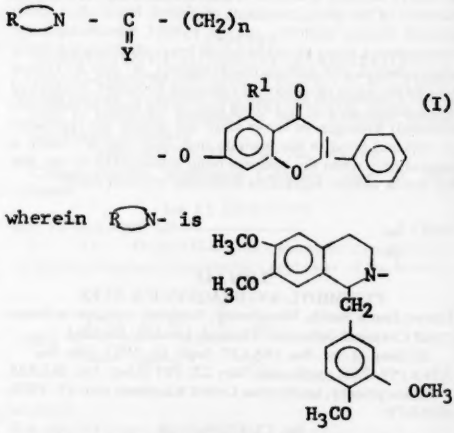
Filed Oct. 24, 1972, Ser. No. 299,895

Claims priority, application France, Oct. 21, 1971, 71.37850; July 13, 1972, 72.25542

Int. Cl. C07d *33/48*

U.S. Cl. 260—287 R **2 Claims**

1. A compound derived from 1-(3,4-dimethoxy benzyl) 6,7-dimethoxy 1,2,3,4-tetrahydro isoquinoline and 2-phenyl gammabenzopyrone, of formula

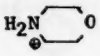


wherein

n is 1, Y is an oxygen atom, and R^1 is the group $-O-(R')-COO^-B^+$ wherein

R' = CH_2 , $-\underset{CH_3}{\overset{}{CH}}-$, $-\underset{CH_2-CH_3}{\overset{}{CH}}-$ or $-\underset{CH_3}{\overset{CH_3}{C}}-$ and

$B^+ = Na^+, K^+, H_3N^+ —CH_2—CH_2OH, H_2N^+(CH_2—CH_2OH)_2, HN^+(CH_2—CH_2OH)_3$ or



3,891,652

ANTIANGINAL ARYLDECAHYDROPYRROLO[3,4-F]QUINOLINES

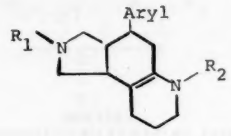
Frederic Peter Hauck, Somerville, and Joseph E. Sundeen, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 28, 1973, Ser. No. 374,593

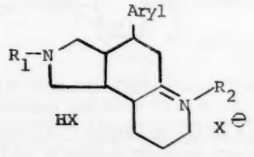
Int. Cl. C07d *33/52*

U.S. Cl. 260—288 R **5 Claims**

1. A compound of the formula



wherein Aryl is selected from the group consisting of phenyl, naphthyl, substituted phenyl and substituted naphthyl, wherein said substituent is selected from the group consisting of lower alkyl, lower alkoxy, di(lower alkyl)amino, halogen and trifluoromethyl, and R_1 and R_2 are selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, aryl-lower alkyl and styryl, and acid addition salts thereof having the formula:



3,891,653

SUBSTITUTED 4-5 DEHYDRO-TETRAZOLO(1,5-A)QUINOLENES

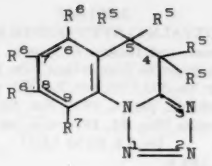
Barry A. Dreikorn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 53,320, July 8, 1970, Pat. No. 3,764,681. This application June 29, 1973, Ser. No. 375,213

Int. Cl. C07d *33/50*

U.S. Cl. 260—288 CF **4 Claims**

1. The compounds of the formula



and the phytologically-acceptable mineral acid addition salts of those compounds wherein R^7 represents amino or R^6 represents $—CH_2Y$ wherein Y is amino or loweralkylamino; wherein, in the above formula

each R^5 independently represents hydrogen, halo, cyano, or loweralkyl of C_1–C_3;

each R^6 independently represents R^5, R^8, loweralkoxy of C_1–C_3, or substituted methyl of the formula

$—CH_2Y$

wherein Y, as above, represents amino, loweralkylamino of C_1–C_3, cyano, hydroxy, halo, or loweralkoxy of C_1–C_3;

R^7 represents R^6, amino, or acetamido; and

R^8 represents alkenyl of C_2–C_3 or alkynyl or C_2–C_3,

subject to the limitation that no more than one R^6 or R^7 substituent represents R^8, that no more than one of the R^5, R^6, and R^7 substituents represents cyano, aminomethyl or cyanomethyl, and that at least five but not more than seven of the R^5, R^6, and R^7 substituents represent hydrogen.

3,891,654

6,7 SUBSTITUTED 3-HYDROXYMETHYL- 1 PHENYL, BENZYL OR PHENYLETHYL SUBSTITUTED ISOQUINOLINES

Raymond Valette, Saulx Les Chartreux, France, assignor to Albert & Rowland S.A., Paris, France

Filed Sept. 21, 1972, Ser. No. 290,813

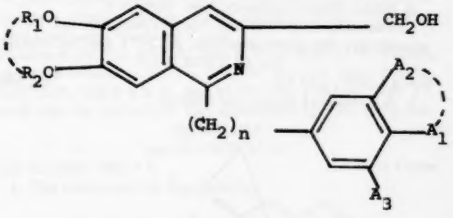
Claims priority, application United Kingdom, Sept. 22, 1971, 44240/71

Int. Cl. C07d *33/38*

U.S. Cl. 260—289 C **5 Claims**

1. A compound of the group consisting of

a. isoquinolines of the formula



in which *n*, is 0, 1 or 2, R_1 is CH_3, C_2H_5, R_2 has the same meaning as R_1, R_1 and R_2 together with the oxygen atoms to which they are bonded being able to form a methylenedioxy chain, where A_1 is OCH_3, OC_2H_5; A_2 is OCH_3, OC_2H_5, A_1 and A_2 considered together being able to form a methylenedioxy chain; A_3 is H, OCH_3, and,

b. non-toxic acid addition salts thereof.

3,891,655

OXYALKYLATED QUINOLINES

Harold A. Palmer, and Thomas E. Sample, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 303,170, Nov. 2, 1972, which is a division of Ser. No. 160,142, July 6, 1971, Pat. No. 3,731,741. This application Mar. 15, 1974, Ser. No. 451,641

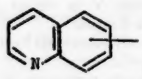
Int. Cl. C07d *33/38*

U.S. Cl. 260—289 R 2 Claims

1. A water-soluble, oxyalkylated, nitrogen-containing aromatic compound of the formula:

$R(OR')_mOH$,

wherein R is



wherein R' is alkylene of from 2 to 4 inclusive carbon atoms, and m is an integer of 5 to 50.

3,891,656

ARYLATION PROCESS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 674,087, Oct. 10, 1967, abandoned, which is a continuation-in-part of Ser. No. 597,553, Nov. 29, 1966, abandoned. This application July 6, 1970, Ser. No. 52,709

Int. Cl. C07c *1/00, 15/12, 15/14*; C07d *31/20*

U.S. Cl. 260—290 R 12 Claims

1. An arylation process comprising:

a. charging to a reaction zone a feed mixture of nitrobenzene, and an aromatic cylic co-reactant selected from the group consisting of methyl benzoate, pyridine, dimethyl phthalate, benzonitrile, thiophene, phenol, toluene, o-xylene, and chlorobenzene, in the mole ratio of about 1:1 to about 1:100 respectively;

b. heating in the presence of an inert gas, the feed mixture to a temperature of about 400° to about 1,000°C for a time sufficient for reaction to occur; and

c. maintaining during the heating period a pressure in the reaction zone of about 0.01 to 1,000 atmospheres.

3,891,657

9BETA-HYDROXY-5-METHYL-6,7-BENZOMORPHANS

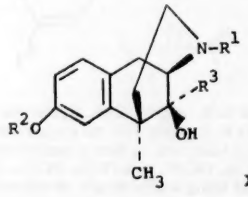
Ivo Monkovic, Candiac; Michel Saucier, Dorval, both of Canada, and Thomas Alfred Montzka, Manilus, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 301,049, Oct. 26, 1972, abandoned. This application Sept. 26, 1973, Ser. No. 400,861

Int. Cl. C07d *39/00*

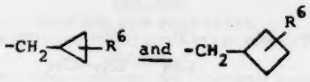
U.S. Cl. 260—293.54 6 Claims

1. A compound having the formula

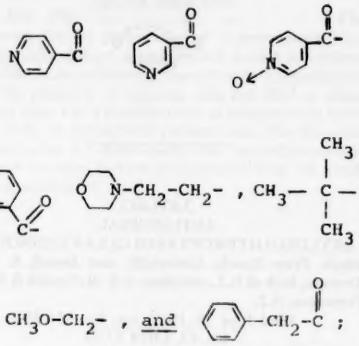


XXXX

wherein R^1 is selected from the group consisting of



in which R^6 is H or CH_3; R^2 is selected from the group consisting of H, (lower) alkyl, (lower)alkanoyl,



R^3 is H, CH_3, C_2H_5, n-C_3H_7, and $-CH_2-CH=CH_2$, or a pharmaceutically acceptable acid addition salt thereof.

3,891,658

N-PHENETHYL TRIALKYLMETHANOBENZ-AZOLINES

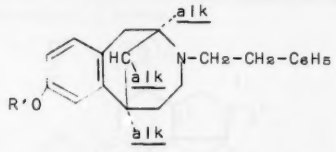
Stephen I. Sallay, Fort Wayne, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 392,844, Aug. 29, 1973. This application Mar. 20, 1974, Ser. No. 452,852

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 3 Claims

1. A substituted benzazocine of the formula



wherein each alk is independently C_1–C_3 alkyl and R' is H or alk and pharmaceutically-acceptable acid additive salts thereof formed with non-toxic acids.

3,891,659

HALOPYRIDYL THIOALKYLTHIOCYANATES

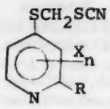
Penelope B. Domenico, Fairfax, Va., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 15, 1974, Ser. No. 460,835

Int. Cl. C07d *31/48, 31/50*

U.S. Cl. 260—294.8 F 6 Claims

1. A compound corresponding to the formula



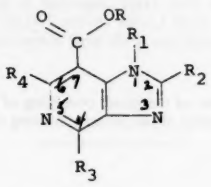
wherein X represents chloro or bromo; n represents an integer of from 2 or 3 and R represents trichloromethyl, trifluoromethyl or methylsulfonyl.

3,891,660
DERIVATIVES OF 1H-IMIDAZO([4,5-C])PYRIDINE-7-CARBOXYLIC ACIDS AND ESTERS

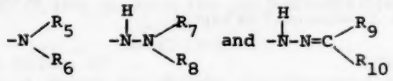
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 7, 1974, Ser. No. 440,620
Int. Cl. C07d *39/00*
U.S. Cl. 260—295.5 B **15 Claims**

1. A compound of the formula



where R is selected from the group consisting of hydrogen and lower alkyl; R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl-lower alkyl, and substituted phenyl and phenyl-lower alkyl wherein said phenyl substituent is selected from the group consisting of lower alkyl, lower alkoxy, halogen, CF_3, amino, and carboxy; R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, and lower alkyl-phenyl; R_3 is selected from the group consisting of lower alkoxy,



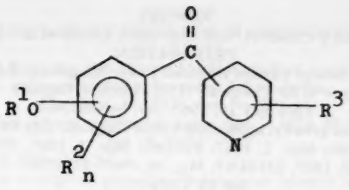
wherein R_5 and R_6 are independently selected from the group consisting of hydrogen and lower alkyl, R_7, R_8 and R_9 are independently selected from the group consisting of hydrogen, lower alkyl, and phenyl, and R_{10} is selected from the group consisting of lower alkyl and phenyl; R_4 is selected from the group consisting of hydrogen, lower alkyl, and phenyl; and pharmaceutically acceptable acid addition salts thereof.

3,891,661
PROCESS FOR PREPARATION OF BENZOYLPYRIDINES AND DERIVATIVES

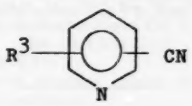
Nobuyuki Sugisaka, Cottage Grove, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Feb. 8, 1974, Ser. No. 440,806
Int. Cl. C07d *31/32*
U.S. Cl. 260—297 R **6 Claims**

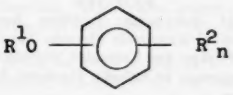
1. A process for the preparation of benzoylpyridines of the formula:



wherein R^1 is hydrogen or lower alkyl; n is zero, one or two; R^3 is hydrogen, lower alkyl, phenyl, phenyl lower alkyl, phenoxy-lower alkyl or halogen; and R^2 is hydroxy, lower alkoxy or lower alkyl, except when R^1 is hydrogen and n is one R^2 is not hydroxy oriented ortho to $-R^1O$; which comprises reacting a cyanopyridine of the formula



wherein R^3 is as defined above, with a benzene derivative of the formula



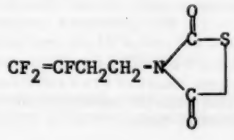
wherein R^1 and R^2 as are defined above in the presence of a Lewis acid catalyst and hydrogen chloride gas under anhydrous conditions at a temperature between 30°C. and 210°C., in an inert solvent, followed by hydrolysis.

3,891,662
N-(3,4,4-TRIFLUOROBUTENE-3)THIAZALODINE DIONE

Mervin E. Brokke, Moraga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 208,032, Dec. 8, 1971, Pat. No. 3,780,050, which is a division of Ser. No. 877,538, Nov. 20, 1969, Pat. No. 3,697,536, which is a division of Ser. No. 490,664, Sept. 27, 1965, Pat. No. 3,513,172. This application Apr. 27, 1973, Ser. No. 355,254
Int. Cl. C07d *91/16*
U.S. Cl. 260—306.7 R **1 Claim**

1. The compound of the formula

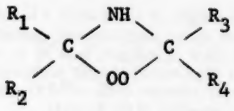


3,891,663
PEROXY COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

Edwin George Edward Hawkins, Lower Kingswood, England, assignor to BP Chemicals (U.K.) Limited, England

Filed July 10, 1967, Ser. No. 651,969
Claims priority, application United Kingdom, July 13, 1966, 31380/66; Mar. 2, 1967, 9963/67; Mar. 2, 1967, 9973/67; May 20, 1967, 23546/67; May 20, 1967, 23547/67
Int. Cl. C07d *85/06*
U.S. Cl. 260—307 F 50 Claims

1. A compound of the formula



(II)

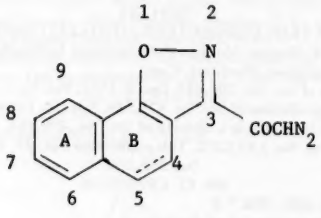
wherein R_1 and R_3 are alkyl of 1 to 5 carbon atoms and R_2 and R_4 are hydrogen, alkyl of 1 to 5 carbon atoms or phenyl.

3,891,664
NAPHTH[2,1-D]ISOXAZOLYL-3-DIAZOMETHYL KETONES

Yasushi Suzuki, Yokohama; Toshihisa Itaya; Nobuyoshi Minami, both of Kawasaki; Masaaki Tarutani; Tokutaro Miki, both of Tokyo, and Katsuhiko Miyasaka, Kawasaki, all of Japan, assignors to Teikoku Hormone MFG Co., Ltd., Tokyo, Japan

Division of Ser. No. 864,163, Oct. 6, 1969, abandoned. This application Jan. 13, 1972, Ser. No. 217,631
Claims priority, application Japan, Oct. 8, 1968, 43-72990; Oct. 8, 1968, 43-72991; Apr. 26, 1969, 44-32241; Apr. 26, 1969, 44-32242; Apr. 26, 1969, 44-32243
Int. Cl. C07d *85/22*
U.S. Cl. 260—307 D 3 Claims

1. A compound of the formula



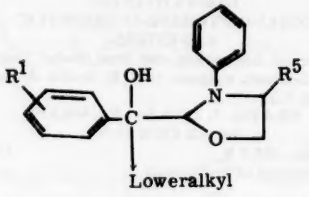
wherein ring A has 0 to 2 substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and halogen, provided that when the substituents are alkyl, they are not adjacent if tertiary butly.

3,891,665
α,3-DIPHENYL-2-OXAZOLIDINEMETHANOL COMPOUNDS

Daniel M. Teller, Devon; Charles J. Guinosso, Abington; Stanley C. Bell, Penn Valley, and George H. Douglas, Paoli, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 204,715, Dec. 3, 1971, Pat. No. 3,817,994. This application Dec. 28, 1973, Ser. No. 429,223
Int. Cl. C07d *85/26*
U.S. Cl. 260—307 F 2 Claims

1. A compound of the formula



in which

R^1 is a member of the group consisting of —H and $—CH_3$;

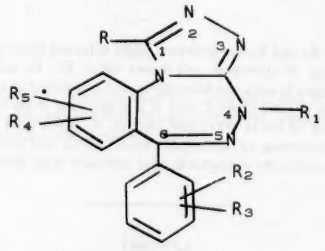
R^5 is a member of the group consisting of —H and lower alkyl.

3,891,666
6-PHENYL-S-TRIAZOLO[4,3-A][1,3,4]-BENZOTRIAZEPINES AND THEIR PREPARATION

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 27, 1973, Ser. No. 391,647
Int. Cl. C07d *55/06*, *57/02*
U.S. Cl. 260—308 B 11 Claims

1. A compound of the formula



wherein R is hydrogen or alkyl of 1 to 3 carbon atoms, inclusive, or cycloalkyl of 3 to 7 carbon atoms, inclusive; wherein R_1 is hydrogen and alkyl defined as above; and wherein R_2, R_3, R_4, and R_5 are hydrogen, alkyl defined as above, fluorine, chlorine, bromine, nitro, or alkylthio of 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts thereof.

3,891,667

PHOSPHORAMIDATE DERIVATIVES

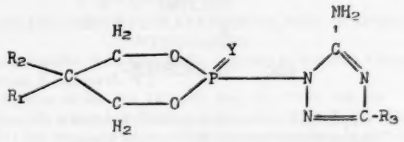
Vincent C. Lintzenich, Collinsville, Ill., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 251,624, May 9, 1972, Pat. No. 3,846,317, and a continuation-in-part of Ser. No. 115,868, Feb. 16, 1971, abandoned, and a continuation-in-part of Ser. No. 803,078, Feb. 27, 1969, abandoned, and a continuation-in-part of Ser. No. 200,217, Nov. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 66,606, Aug. 24, 1970, abandoned. This application Aug. 15, 1974, Ser. No. 497,778

Int. Cl. C07d *105/04*

U.S. Cl. 260—308 R 6 Claims

1. A compound having the formula



wherein R_1 and R_2 are each selected from the group consisting of hydrogen and $C_{1\text{-}20}$ alkyl groups, R_3 is selected from the group consisting of hydrogen, alkyl, aryl and alkaryl, said alkyl, aryl and alkaryl groups having from 1 to 12 carbon atoms, and Y is selected from the group consisting of oxygen and sulfur.

3,891,668

SYNTHESIS OF 1-SUBSTITUTED-2-(P-FLUOROPHENYL)-5-NITROIMIDAZOLES

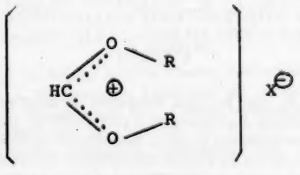
Janos Kollonitsch; Alan N. Scott, both of Westfield, and George A. Doldouras, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 289,498, Sept. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 40,448, May 25, 1970, abandoned. This application May 15, 1974, Ser. No. 470,237

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 4 Claims

1. A process for alkylating 2-(p-fluorophenyl)-4(5)-nitroimidazole which comprises reacting in a solvent free from protons bonded to any oxygen or nitrogen atoms of said solvent, at a temperature of from −10°C. to the reflux temperature of the solvent employed, one molar equivalent of 2-(p-fluorophenyl)-4(5)-nitroimidazole with from 1–5 molar equivalents of a dialkoxycarbonium salt of the formula:



wherein R is loweralkyl of from 1–6 carbon atoms and X^- is BF^-_4, $SbCl^-_6$, or SbF^-_6.

3,891,669

THIOL-GROUP DETECTING FLUORESCENCE REAGENTS

Yuichi Kanaoka, and Minoru Machida, both of Sapporo, Japan, assignors to Yuichi Kanaoka, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,321

Claims priority, application Japan, Apr. 2, 1973, 48-37584

Int. Cl. C07d *27/18*

U.S. Cl. 260—326.34 1 Claim

1. A thiol-group detecting fluorescence reagent selected from the group consisting of:

N-3-(4-methyl-7-dimethylaminocoumarinyl)maleimide, and

N-6-(4-methyl-7-dimethylaminocoumarinyl)maleimide.

3,891,670

N-(1-ANILINO NAPHTHYL-4) MALEMIDE THIOL-GROUP DETECTING REAGENT

Yuichi Kanaoka; Mikiko Machida, and Minoru Machida, all of Sapporo, Japan, assignors to Yuichi Kanaoka, Tokyo, Japan

Filed Sept. 11, 1973, Ser. No. 396,320

Claims priority, application Japan, Oct. 5, 1972, 47-100122

Int. Cl. C07d *27/18*

U.S. Cl. 260—326.5 FM 1 Claim

1. A thiol-group detecting reagent consisting of N-(1-anilinonaphthyl-4)maleimide.

3,891,671

N-(2-PYRROLIDYL OR PIPERIDYL ALKYL)-4-HYDROXY BENZAMIDES

Michel Leon Thominet, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France

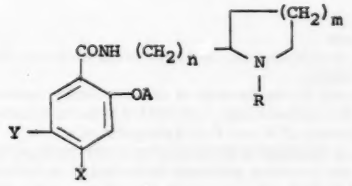
Continuation of Ser. No. 145,871, May 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 845,523, July 28, 1969, abandoned. This application July 24, 1973, Ser. No. 382,251

Claims priority, application France, Aug. 1, 1968, 68.161593; Oct. 29, 1968, 68.171761

Int. Cl. C07d *27/04*

U.S. Cl. 260—326.47 8 Claims

1. A compound selected from the group consisting of heterocyclic benzamides and their pharmaceutically acceptable acid addition salts and quaternary ammonium salts, said heterocyclic benzamides having the formula:



in which A is allyl or lower alkyl; R is allyl or lower alkyl; X is hydroxy; Y is halogen, *m* is a whole number less than 3 and *n* is a whole number less than 4.

3,891,672

PROCESS FOR PREPARING R-SULTONES

Charles David Broaddus, Cincinnati, and Medford Dwight Robbins, Fairfield, both of Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 26, 1972, Ser. No. 292,354

Int. Cl. C07d *89/06*

U.S. Cl. 260—327 S 7 Claims

1. A process for preparing γ-sultones comprising admixing a gaseous mixture comprising monomolecular SO_3 and an

inert gas with a gaseous mixture comprising an olefin having at least a four carbon atom chain and an inert gas at a temperature of from about 100°C to about 150°C the ratio of a monomolecular SO_3-to-olefin being about 1:2.

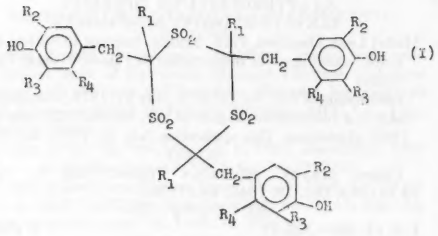
3,891,673

HINDERED PHENOLIC S-TRITHIANE 1,1,3,3,5,5-HEXAOXIDES

John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 23, 1974, Ser. No. 472,557
Int. Cl. C07d 77/02
U.S. Cl. 260—327 T 6 Claims

1. A compound having the formula



(I)

wherein

R_1 is independently hydrogen or alkyl of 1 to 18 carbon atoms,

R_2 and R_3 are the same or different alkyl groups of from 1 to 8 carbon atoms, cycloalkyl of from 5 to 6 carbon atoms or one of R_2 and R_3 is hydrogen, and

R_4 is hydrogen or lower alkyl of from 1 to 6 carbon atoms and providing that when R_4 is alkyl, R_1 is hydrogen.

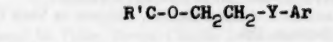
3,891,674

ESTERS OF ARYL-ALIPHATIC ALCOHOLS

Guy D. Diana, Stephentown, and William B. Hinshaw, Jr., Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

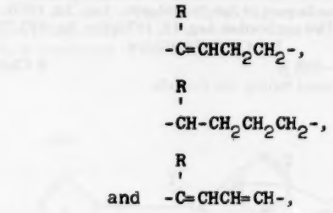
Filed Jan. 17, 1973, Ser. No. 324,543
Int. Cl. C07d 13/10
U.S. Cl. 260—340.5 7 Claims

1. A compound of the formula



wherein

Y is selected from the group consisting of



R' is hydrogen, 3,4-methylenedioxyphenyl or a saturated or mono-olefinic hydrocarbon moiety having from 1 to 10 carbon atoms selected from the group consisting of alkyl, alkenyl, cycloalkyl, cycloalkenyl, alkylcycloalkyl, alkylcycloalkenyl and alkenylcycloalkyl,

R is hydrogen or lower-alkyl of 1 to 4 carbon atooms; and Ar is phenyl substituted by 3,4-methylenedioxy or one or two monovalent substitutents selected from the group consisting of carbo-lower-alkoxy of 2 to 4 carbon atoms, halogen, trifluoromethyl and trifluoromethoxy.

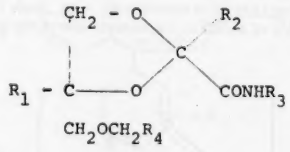
3,891,675

DIOXOLANYL CARBONYL UREAS AND THIOUREAS

Eirlys R. Isaac, Sittingbourne, and Peter Kirby, Maidstone, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed June 25, 1974, Ser. No. 482,936
Claims priority, application United Kingdom, July 3, 1973, 31604/73
Int. Cl. C07c 127/22, 157/22
U.S. Cl. 260—340.9 4 Claims

1. An amide derivative of the formula



wherein R_1 and R_2 each represents an alkyl group of 1–6 carbon atoms, R_3 represents a carbamoyl, or thiocarbamoyl group N-substituted by alkyl, haloalkyl or cycloalkyl of up to 6 carbon atoms, by phenyl, alkylphenyl, nitrophenyl, alkoxyphenyl, or fluoro- or chlorophenyl of up to 8 carbon atoms, or by alkenyl of up to 6 carbon atoms, and R_4 represents a phenyl group optionally substituted by fluorine or chlorine or by an alkyl group of 1–6 carbon atoms.

3,891,676

2-ALPHA-CARBOXY-3-ALPHA(HYDROXYETHYL)-5-OXOCYCLOPENTANE DERIVATIVES

Chan-Hwa Kuo, South Plainfield; David Taub, Metuchen, and Norman L. Wendler, Summit, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 290,590, Sept. 20, 1972, Pat. No. 3,850,952. This application Oct. 15, 1973, Ser. No. 406,714

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **6 Claims**

1. 2α-Carboxy-3α-(1,1-dihydroxyethyl)-5-oxocyclopentaneheptanoic acid carboxymethyl ester, γ-lactone 5-cyclic ethylene acetal.

3,891,677

17α,20,20,21-BISMETHYLENEDIOXY-4,5-SECO-3-PREGNYNE-5-ONES

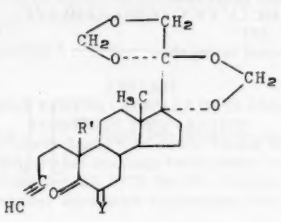
Masato Tanabe, Palo Alto, Calif., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 102,095, Dec. 28, 1970, Pat. No. 3,796,728, which is a division of Ser. No. 647,315, June 20, 1967, Pat. No. 3,835,160, which is a continuation-in-part of Ser. No. 644,761, June 6, 1967, abandoned. This application July 18, 1973, Ser. No. 380,319

Int. Cl. C07d *13/04*

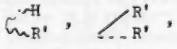
U.S. Cl. 260—340.9 **4 Claims**

1. A compound selected from the group consisting of 5-keto-4,5-seco-3-pregnynes having the following formula:



wherein R′ is a member selected from the group consisting of hydrogen and alkyl having up to 12 carbon atoms; said alkyl being saturated or unsaturated;

Y is a member selected from the group consisting of hydrogen,



and polymethylene having from 2 to 8 carbon atoms; and the 11-keto analogs thereof.

3,891,678

PREPARATION OF ALKYLATED OR NON-ALKYLATED DIHYDROCOUMARIN TOGETHER WITH THE CORRESPONDING ALKYLATED, OR NON-ALKYLATED, COUMARIN

Egidius J. M. Verheijen; Jozef A. Thoma, both of Sittard, and Johannes J. M. Deumens, Limbricht, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

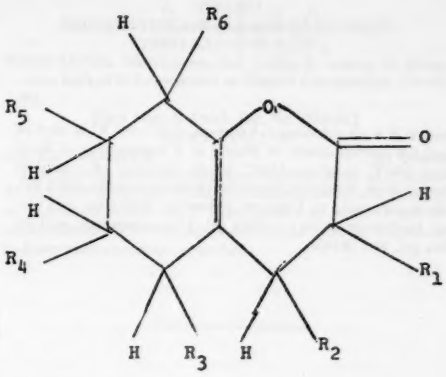
Filed Aug. 24, 1973, Ser. No. 391,516

Claims priority, application Netherlands, Aug. 31, 1972, 7211839

Int. Cl. C07d *7/26*

U.S. Cl. 260—343.2 R **8 Claims**

1. In a process for dehydrogenating a first compound of the formula



where R_1, R_2, R_3, R_4, R_5 and R_6 each independently represent hydrogen or lower alkyl, provided that the total number of carbon atoms in R_1–R_6 inclusive is at most 10, at a temperature of 150° to 400°C in contact with a catalytic amount of a metal dehydrogenation catalyst, wherein the metal is at least one metal of Group VIII of the Periodic Table to produce second compounds selected from the group consisting of dihydrocoumaurin and alkylated derivatives thereof, the improvement comprising conducting the dehydrogenation process in the liquid phase and at a temperature of 200° to 375°C while removing hydrogen from the reaction zone, and contacting the catalyst and the starting material at about the dehydrogenation temperature, whereby said first compound is obtained in the resulting reaction mixture in a molar ratio of said first compound: said second compound of at least 1:5.

3,891,679

PRODUCTION OF 2,2-DISUBSTITUTED PROPIOLACTONES

Robert P. Allen, and Hugh J. Hagemeyer, Jr., both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

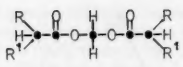
Filed Nov. 3, 1972, Ser. No. 303,570

Int. Cl. C07d *3/00*

U.S. Cl. 260—343.9 **22 Claims**

1. A process for producing 2,2-disubstituted propiolactone having the formula

which comprises the steps of pyrolyzing a methylene diester having the formula



wherein R is alkyl having 1-4 carbon atoms and R^1 is alkyl of from 1-4 carbon atoms or phenyl at a temperature of from about 240°C. to about 360°C. in the presence of a catalyst selected from the group consisting of silica-alumina, silica gel, sodium carbonate on Celatom, potassium hydroxide on Celatom, lanthanum oxide on silica gel, 12-tungstosilicic acid on silica gel, and titania.

3,891,680
MALEIC ANHYDRIDE RECOVERY USING NONAQUEOUS MEDIUM

Kiyoshi Katsumoto, El Cerrito, and Wilton H. Lind, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 29, 1972, Ser. No. 310,320
Int. Cl. C07c *57/14*
U.S. Cl. 260—346.8 M **16 Claims**

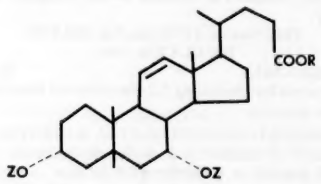
1. The method for the recovery of maleic anhydride from a gaseous mixture containing the anhydride, which comprises contacting said mixture with a scrubbing agent in the liquid phase at a temperature below about 260°C. and at a pressure sufficient to effect maleic anhydride absorption into the liquid phase, said agent being one or more dialkyl phthalates having from 4 to 8 carbon atoms in each alkyl group and a total of 10 to 14 carbon atoms in both alkyl groups, and said pressure being in the range from about 0.07 to 7 atmospheres.

3,891,681
SYNTHESIS OF STEROIDS

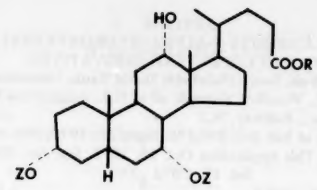
William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

Continuation of Ser. No. 307,060, Nov. 16, 1972, Pat. No. 3,833,260. This application Nov. 26, 1973, Ser. No. 419,014
Int. Cl.² C07J *9/00*
U.S. Cl. 260—397.1 **8 Claims**

1. The method of producing compounds of the formula



which comprises reacting a compound of the formula



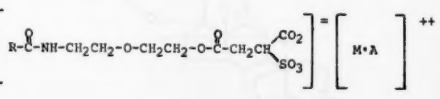
wherein each Z is hydrogen or acyl; and R is hydrogen or lower alkyl; with a dehydrating agent selected from the group consisting of methane sulfonyl chloride, methyl chlorosulfite, and thionyl chloride.

3,891,682
ACYLAMIDOETHOXYETHYL SULFOSUCCINATE SALTS, METHODS OF PRODUCING THE SAME AND FROTH-FORMING COMPOSITIONS CONTAINING THE SAME

Robert Ernst, Los Angeles, and Eugene J. Miller, Huntington Beach, both of Calif., assignors to Textilana Corporation, Hawthorne, Calif.

Filed Aug. 30, 1973, Ser. No. 392,976
Int. Cl.² C07C *143/90;* **C11D** *1/28*
U.S. Cl. 260—401 **12 Claims**

1. A compound having the constitutional formula



where R is an alkyl or an alkenyl group having from 7–19 carbon atoms in an uninterrupted carbon-carbon chain, M may be an alkali metal or alkaline earth cation which results in a soluble salt, A may be M or ammonia or a water soluble salt forming amine, or H.

3,891,683
PROCESS FOR MANUFACTURING POLYOL ESTERS OF CARBOXYLIC ACIDS

Hiroshi Isa, Funabashi; Takeo Inagaki, Yachiyo; Yasuhiro Kiyonaga, Narashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,271
Claims priority, application Japan, Feb. 7, 1973, 48-015268
Int. Cl. C07c *67/00*
U.S. Cl. 260—410.6 **6 Claims**

1. In a process for preparing polyol esters of carboxylic acids, comprising reacting an olefin having from 3 to 30 carbon atoms and a polyhydric alcohol, wherein the molar ratio of said olefin to the reactive hydroxyl groups of said polyhydric alcohol is about 1/1 or more, with an excess of carbon monoxide at a pressure in the range of from 60 to 300 kg/cm², the reaction being carried out at a temperature of from 90° to 250°C., in the presence of a first catalyst of cobalt, nickel or rhodium, and a second catalyst of pyridine, alkylated pyridine or vinyl pyridine, the improvement which comprises the steps of:

contacting said first and second catalysts with said carbon monoxide and said olefin, in the absence of said polyhydric alcohol, at a temperature and a pressure within the

aforesaid ranges to obtain a pretreated catalyst composition, and then adding said polyhydric alcohol to the reaction system and carrying out said polyol ester manufacturing process using said pretreated catalyst composition.

3,891,684

PREPARATION OF ORGANOMETALLIC COMPLEXES

Herbert A. Jung, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 4, 1971, Ser. No. 195,845
Int. Cl. C07c *15/00*
U.S. Cl. 260—429 R 15 Claims

4. A method of preparing organometallic complexes of palladium or platinum in a zerovalent state which comprises contacting in the liquid phase and in the substantial absence of oxygen;

a. a palladium or platinum compound selected from the group consisting of salts, chelates and coordination compounds containing palladium or platinum ions having a valence state of at least +1 with;

b. complexing ligands having the formula $R_1R_2R_3L$ wherein R_1, R_2 and R_3 are independently selected from the group consisting of alkyl radicals having from 1 to 5 carbon atoms, phenyl radicals, alkaryl radicals having from 7 to 10 carbon atoms and aralkyl radicals having from 7 to 10 carbon atoms and L is phosphorus, arsenic or antimony; said complexing ligands being present in at least the stoichiometric amount, said contacting to be carried out at a temperature in the range of from about 40°C. to about 150°C. and in the presence of an alkanol having from 1 to 12 carbon atoms.

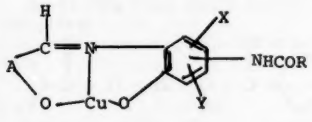
3,891,685

AZOMETHINE COPPER COMPLEX DYES AND PROCESS FOR THEIR PREPARATION

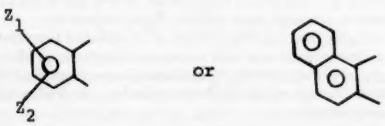
Stefan Hari, Allschwil, and Karl Ronco, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1972, Ser. No. 314,283
Claims priority, application Switzerland, Dec. 13, 1971, 18146/71
Int. Cl. C07f *1/08*
U.S. Cl. 260—438.1 5 Claims

1. A copper complex of an azomethine dyestuff of the formula



wherein A is



R is alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, benzyl, phenylethyl, styryl or phenylamino unsubstituted for substituted by chloro, bromo, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms,

X, Y, Z_1 and Z_2 is hydrogen, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or nitro.

3,891,686

PREPARATION OF ALUMINUM HYDRIDE TRIALKYLAMINATES

Robert Ehrlick, Morristown, and Archie R. Young, II, Montclair, both of N.J., assignors to Thiokol Corporation, Bristol, Pa.

Filed May 6, 1963, Ser. No. 278,802
Int. Cl. C07f *5/06*
U.S. Cl. 260—448 R 11 Claims

1. A process for preparing aluminum hydride trialkylaminates which comprises contacting lithium aluminum hydride, an aluminum halide and a trialkylamine in an inert solvent under substantially anhydrous conditions until an aluminum hydride trialkylaminate is formed.

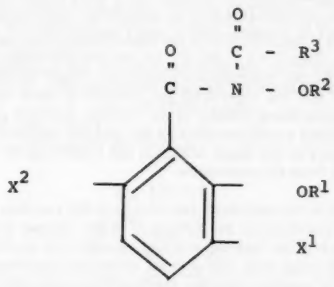
3,891,687

2-ALKOXY 3,5-DIHALO-BENZALDOXIMES

Sidney B. Richter, and Eugene F. Barnas, both of Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 779,247, Nov. 26, 1968, Pat. No. 3,597,467. This application Oct. 19, 1970, Ser. No. 82,181
Int. Cl.[2] C07C *119/18*
U.S. Cl. 260—453 R 1 Claim

1.



wherein X^1 and X^2 are halogen; R^1 and R^2 are lower alkyl; and R^3 is lower alkyl.

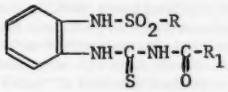
3,891,688

THIOUREIDO SULFONANILIDE COMPOSITIONS

Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 217,697, Dec. 29, 1971, Pat. No. 3,832,384. This application June 12, 1974, Ser. No. 478,492
Int. Cl.[2] C07C *155/02*
U.S. Cl. 260—455 A 3 Claims

1. Compounds corresponding to the generic formula:



wherein R is lower alkyl or phenyl and R_1 is lower thioalkyl.

3,891,689
CONTINUOUS SULPHONATION PROCESS

Alan Pryce, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,880

Claims priority, application United Kingdom, Jan. 20, 1971, 2766/71

Int. Cl. C07c *141/02, 143/02, 143/24*

U.S. Cl. 260—458 **2 Claims**

1. A continuous process wherein a liquid organic material selected from the group consisting of:

a. linear- and branched-chain alkyl benzenes, the alkyl chains of which contain from about 10 to about 18 carbon atoms;

b. linear unsubstituted monohydric alcohols containing from about 8 to about 20 carbon atoms, and

c. linear unsubstituted alpha-olefins containing from about 10 to about 20 carbon atoms; is reacted with sulphur trioxide in a sulphur trioxide-air mixture in two separate steps, the initial step being conducted by passing the sulphur trioxide-air mixture and the liquid organic material longitudinally through an initial longitudinally extending reaction chamber with a superficial gas velocity of from about 5 to about 30 feet per second, the second step being conducted by passing the material emerging from said initial reaction chamber longitudinally through a second longitudinallyextending reaction chamber cross-section with a superficial gas velocity which is higher than the superficial gas velocity in said initial reaction chamber and which is from about 15 to about 90 feet per second, the initial concentration of sulphur trioxide in the sulphur trioxide-air mixture being from about two percent to about 15 percent by volume, the initial mole ratio of the sulphur trioxide to the liquid organic material being from about 0.9:1 to about 1.5:1, the pressure under which the reaction is conducted being from about 5 to about 30 psia, and the superficial gas velocity in each reaction chamber being defined as the velocity at which gaseous reactants would pass through the reaction chamber in the absence of any liquid reactants and which may be calculated from the expression

$$S = V/A$$

wherein S is the superficial gas velocity in the reaction chamber, expressed in feet per second, V is the volume of gas at STP which is fed into the reaction chamber per second, expressed in cubic feet, and A is the transverse cross-sectional area of the reaction chamber expressed in square feet.

3,891,690
PROCESS FOR THE PREPARATION OF METAL AND METAL FLUORIDE PRODUCTS

Gilbert S. Layne, and James O. Huml, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 445, Jan. 2, 1970, abandoned. This application June 23, 1972, Ser. No. 265,783

Int. Cl. C01f *7/54;* **C01b** *31/18;* **C21b** *15/00*

U.S. Cl. 423—465 **2 Claims**

1. A process which comprises:

a. reacting $NaAlO_2$, carbon, NaF or Na_2O, and FeF_2, at a temperature of at least about 900°C, said reactants being provided in an amount to provide a fluoride atom to oxygen atom ratio ranging from about 0.01 to about 10 and a carbon atom to oxygen atom ratio of at least about 1, thereby to produce products of Na_3AlF_6, Fe and CO, and

b. separating said products from each other.

3,891,691
STYRYL DYES

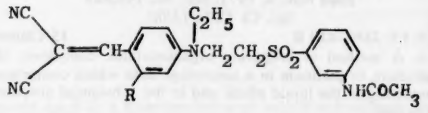
Guido R. Genta, Snyder, N.Y., assignor to American Aniline Products, Inc., Lock Haven, Pa.

Continuation-in-part of Ser. No. 227,296, Feb. 17, 1972, Pat. No. 3,756,778. This application June 7, 1973, Ser. No. 367,826

Int. Cl. C07c *121/70*

U.S. Cl. 260—465 D **2 Claims**

1. A compound of the formula



wherein R is hydrogen, methyl, chlorine or bromine.

3,891,692
N-(CYCLOPROPYLALKOXYCARBONYL)AMINO ACIDS

Daniel F. Veber, and Stephen F. Brady, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 3, 1972, Ser. No. 249,975

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **3 Claims**

1. A compound selected from the group consisting of N-(cyclopropylmethoxycarbonyl) and N-(1-cyclopropylethoxycarbonyl) derivatives of the α-amino grouping of glycine, alanine, valine, leucine, isoleucine, phenylalanine, tyrosine, serine, threonine, aspartic acid, glutamic acid, arginine, lysine, and ornithine; and lower alkyl, benzyl, phenylethyl, phenyl and p-nitrophenyl esters thereof.

3,891,693
METHOD FOR MAKING ALKYLENE-BIS(NITROBENZOATE)S

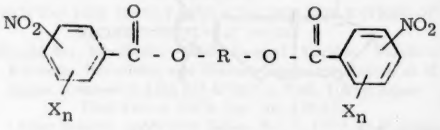
Jack Preston, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 353,285, April 23, 1973. This application Aug. 1, 1974, Ser. No. 494,019

Int. Cl. C07c *101/68*

U.S. Cl. 260—471 R **4 Claims**

1. A method of producing an alkylene-bis(nitrobenzoate) of the formula:



wherein X is a halogen, n is an integer of 0–4 and R is a C_2–C_x alkylene or cycloalkylene radical characterized by:

a. bringing into reacting contact at an elevated temperature a nitrobenzoic acid and a saturated aliphatic or alicyclic glycol in substantially stoichiometric amounts to produce the corresponding hydroxycycloakyl or hydroxyalkyl nitrobenzoate;

b. after the production of the hydroxycycloalkyl or hydroxyalkyl nitrobenzoate is substantially completed, adding to the reaction mixture additional nitrobenzoic acid;

c. reacting the hydroxycycloalkyl or hydroxyalkyl nitrobenzoate with the added nitrobenzoic acid to produce the alkylene-bis(nitrobenzoate); and

d. separating the resulting benzoate product from the reaction mixture.

3,891,694

PLASTICIZER PURIFICATION

Robert H. Mills, St. Louis, and Richard R. Raube, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 18, 1970, Ser. No. 38,499
Int. Cl. C07c *69/44, 69/60, 69/80*
U.S. Cl. 260—475 B 9 Claims

1. In a method for purifying a plasticizer for synthetic resins which is an alkyl, aryl or mixed alkyl-aryl ester of an organic acid the improvement which comprises simultaneously treating said ester with steam and an aliphatic or aromatic peracid at a temperature of at least about 120°C.

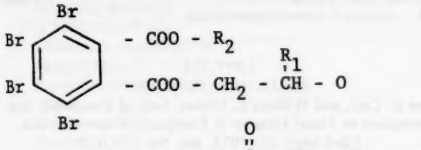
3,891,695

BROMINE-CONTAINING ESTERS

Dilip K. Ray-Chaudhuri, Somerville; Paul C. Georgoudis, Dunellen, and Hans H. Stockmann, Plainfield, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 169,072, Aug. 4, 1971, Pat. No. 3,793,293. This application Nov. 23, 1973, Ser. No. 418,169
Int. Cl.[2] C07C *69/80, 69/54*
U.S. Cl. 260—475 N 1 Claim

1. A bromine-containing, ethylenically unsaturated maleate ester corresponding to the general structural formula



wherein:
R_1 = H, or CH_3, and
R_2 = alkyl radical having 1 to 4 carbon atoms.

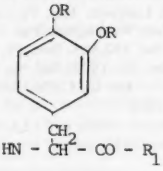
3,891,696

NOVEL, TRANSIENT PRO-DRUG FORMS OF L-DOPA

Nicolae S. Bodor; Kenneth B. Sloan, and Anwar A. Hussain, all of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed Nov. 2, 1973, Ser. No. 412,419
Int. Cl. C07c *67/08, 103/52, 101/72*
U.S. Cl. 260—479 R 7 Claims

1. A novel, transient, pro-drug compound of the formula:



wherein R represents a member selected from the group consisting of a hydrogen atom a $—COCH_3$ group, a $—COC_2H_5$ group, a $—COOC_2H_5$ group, and a $—CO—C(CH_3)_3$ group; wherein R_1 represents a member selected from the group consisting of a hydroxyl group, and a —OM group, wherein M represents a member selected from the group consisting of an alkali metal and an ammonium ion; and wherein R_2 represents a $(R_3)CO—CH=C(R_4)—$ group, wherein R_4 represents a methyl group or ethoxy group, and wherein R_3 represents a member selected from the group consisting of a methyl group, a $—C_6H_5$ group, and a $—OC_2H_5$ group.

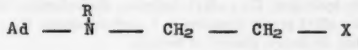
3,891,697

COMPOSITIONS USEFUL FOR TREATING PARKINSONISM

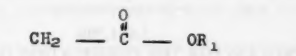
Elijah H. Gold, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Oct. 19, 1973, Ser. No. 408,021
Int. Cl. C07c *101/14*
U.S. Cl. 260—468 G 7 Claims

1. Compounds of the formula:



wherein Ad is 1-adamantyl; R is H or CH_3; X is COOM or



wherein M is H or a pharmaceutically acceptable acid addition cation, and R_1 is lower n-alkyl; and the pharmaceutically acceptable salts thereof.

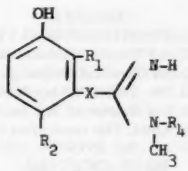
3,891,698

ω-(3-HYDROXYPHENYL)SUBSTITUTED AMIDINES AND DERIVATIVES THEREOF AS ANTHELMINTIC AGENTS

James W. McFarland, Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 664,258, Aug. 30, 1967, Pat. No. 3,579,510. This application Sept. 25, 1970, Ser. No. 75,776
Int. Cl. C07c *123/00*
U.S. Cl. 260—501.14 6 Claims

1. A compound of the formula:



and the non-toxic acid addition salts thereof wherein each of R_1 and R_2 is selected from the group consisting of hydrogen, methyl, chloro, bromo and iodo, with the proviso that at least one of R_1 and R_2 is hydrogen; R_4 is selected from the group consisting of methyl, ethyl, methoxy, methylamino and allyl and X is trans-vinylene.

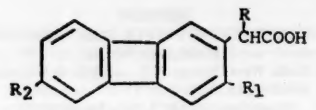
3,891,699

BIPHENYLENEALKANOIC ACIDS

Bruce E. Witzel, and Tsung-Ying Shen, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 72,531, Sept. 15, 1970, abandoned. This application Apr. 21, 1972, Ser. No. 246,487
Int. Cl. C07c *63/52, 63/54*
U.S. Cl. 260—515 R 3 Claims

1. A compound of the formula:



where

R is hydrogen or methyl;

R_1 is hydrogen, C_{1-7} alkyl, halogen, dialkylamino wherein the alkyl group contains 1–7 carbon atoms, C_{1-7} alkylthio, hydroxy, phenyl or benzyl;

R_2 is hydrogen, halogen, trifluoromethyl, hydroxy or C_{1-7} alkoxy.

3,891,700

PROCESS FOR THE PURIFICATION OF CRUDE TEREPHTHALIC

Herbert Jenkner, Cologne, Germany, assignor to Chemische Fabrik Kalk GmbH, Germany

Filed June 21, 1973, Ser. No. 372,317

Claims priority, application Germany, Sept. 29, 1972, 2247749

Int. Cl. C07c *63/26, 51/42*

U.S. Cl. 260—525 **9 Claims**

1. A process for the purification of crude terephthalic acid containing carboxybenzaldehyde as an impurity to substantially pure terephthalic acid useful in the production of fibers, which comprises dissolving said crude terephthalic acid in an aqueous alkaline hydroxide solution selected from the group consisting of sodium hydroxide, potassium hydroxide and ammonium hydroxide solutions; adding an elemental halogen selected from the group consisting of bromine and chlorine to the resultant solution; maintaining said resultant solution at a reaction temperature of about 20°–120°C. for a period of time sufficient for said halogen to react with said impurity; acidifying the reaction mixture; and separating the purified terephthalic acid from said acidified mixture.

3,891,701

COMPOSITIONS OF MATTER

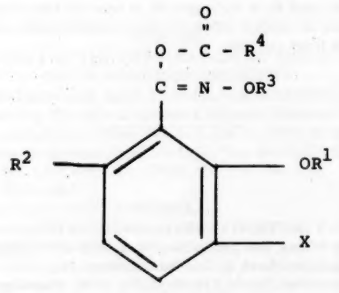
Sidney B. Richter, and Eugene Barnas, both of Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 148,197, May 26, 1971, Pat. No. 3,840,874, which is a division of Ser. No. 765,962, Oct. 8, 1968, Pat. No. 3,649,664. This application Oct. 20, 1972, Ser. No. 299,497

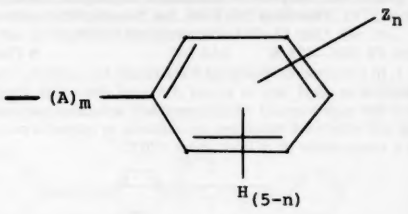
Int. Cl. C07c *131/00*

U.S. Cl. 260—545 R **2 Claims**

1. A compound of the formula



wherein X is halogen; R^1 and R^3 are lower alkyl; R^2 is selected from the group consisting of lower alkyl and lower alkoxy; R^4 is selected from the group consisting of lower alkyl and lower alkenyl.



3,891,702

1-UREIDO-5-AMINOCAPRONAMIDE

Geertrudes H. Suverkropp, Geleen, and Werner Reichrath, Stein, both of Netherlands, assignors to Stamicarbon, N.V., Geleen, Netherlands

Division of Ser. No. 348,519, April 6, 1973, which is a continuation of Ser. No. 211,713, Dec. 23, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 459,207

Int. Cl. C07c *127/14, 99/00, 101/24*

U.S. Cl. 260—553 R **1 Claim**

1. 1-ureido-5-aminocapronamide.

3,891,703

SULFAMIDE PROCESS

John D. Catt, and William L. Matier, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Sept. 20, 1973, Ser. No. 399,025

Int. Cl. C07c *143/72*

U.S. Cl. 260—556 N **7 Claims**

1. The process for preparing an N-substituted sulfamide bearing at least one hydrogen atom and from 1 to 3 organic groups attached to the sulfamide nitrogen atoms thereof, said organic groups being stable under the reaction conditions to trifluoroacetic acid and having molecular weights of from 17 to 300 which comprises contacting a sulfamide bearing at least one tert.-butyl group and said organic groups on the sulfamide nitrogen atoms thereof with at least a molecularly equivalent amount of trifluoroacetic acid relative to said tert.-butyl group at a temperature of from −15°C. to 40°C. for a time period sufficient to result in replacement of said tert.-butyl group with hydrogen.

3,891,704

PSEUDOTHIURONIUM COMPOUNDS

Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 102,515, Dec. 29, 1970. This application Dec. 26, 1972, Ser. No. 318,302

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 E **2 Claims**

1. The compound which is 2-(2,6-dibromo-4-trifluoromethylbenzyl)-2-pseudothiuronium bromide.

3,891,705

S-TRIAZINES

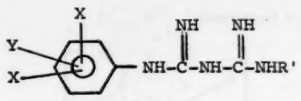
Julius Diamond, Lafayette Hill, and George H. Douglas, Paoli, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 189,191, Oct. 14, 1971, Pat. No. 3,767,656. This application Mar. 15, 1973, Ser. No. 337,055

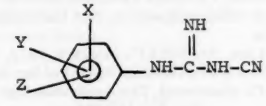
Int. Cl. C07c *129/08*

U.S. Cl. 260—565 **4 Claims**

1. A process for the preparation of a biguanide compound of the formula:



where:
X, Y and Z may be substituted at any position of the ring and
X is hydrogen,
fluoro,
chloro,
bromo or
iodo or halololoweralkyl;
Y is hydrogen,
loweralkyl,
halo,
nitro,
amino,
loweracylamino,
mono- & diloweralkylamino,
halololoweralkyl,
halololoweralkoxy,
loweralkoxy,
hydroxy,
cyano or
loweralkylsulfonyl;
Z is halololoweralkoxy,
diloweralkylsulfonamido
halololoweracyl,
halololoweralkylsulfonamido,
cyano
halololoweralkyl,
fluoro,
iodo,
bromo or
chloro; and
R′ is hydrogen,
loweralkyl,
loweralkenyl,
cyclololoweralkyl or
arloweralkyl;
which comprises
intimately contacting a 1-cyano-3-substituted phenyl guinidine of the formula



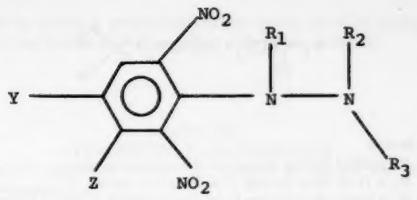
where X, Y and Z are as described above with an aliphatic amine of the formula

NH_2R'

where R′ is as described above in the presence of a phenolic solvent selected from the group consisting of
phenol,
cresol and
xylol;
at temperatures from about 25° to 150°C and isolating said biguanide.

3,891,706
2-AMINO-2,6-DINITROPHENYLHYDRAZINES
Merrill Wilcox, 2911 N.W. 30th Ter., Gainesville, Fla. 32601
Filed Oct. 2, 1972, Ser. No. 294,147
Int. Cl. C07c *109/04*
U.S. Cl. 260—569 **10 Claims**

1. A compound of the formula



wherein Y is halogen or trifluoromethyl; Z is amino or mono or di-lower alkylamino; R_1 is H, lower alkyl or lower alkenyl; and R_2 and R_3 are independently H, lower alkyl, or lower alkenyl.

3,891,707
HYDROGENATION PROCESS
Dhafir Yusuf Waddan, Blackley, England, assignor to Imperial Chemical Industries Limited, London, England
Filed May 22, 1972, Ser. No. 255,669
Claims priority, application United Kingdom, June 4, 1971, 19008/71
Int. Cl. C07c *85/10*
U.S. Cl. 260—583 K **7 Claims**

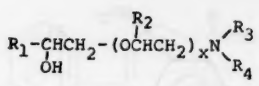
1. A process for the manufacture of hexamethylene diamine which comprises hydrogenating adiponitrile or 1,4-dicyanobutene by heating with hydrogen at a temperature of 50° to 200°C at a pressure of 1 to 500 atmospheres in the presence of a reduced cobalt borate catalyst.

3,891,708
PURIFICATION OF DIMETHYLAMINOPROPYLCHLORIDE HYDROCHLORIDE
Guy Thomas Woodrum, Canonsburg, and Richard E. Barnett, Corapolis, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.
Filed Mar. 28, 1974, Ser. No. 455,707
Int. Cl. C07c *87/127*
U.S. Cl. 260—583 N **6 Claims**

1. The process for purifying aqueous solutions of 3-dimethylaminopropylchloride or the hydrochloride salt thereof which comprises passing an aqueous solution containing from 1 to 99 percent by weight of 3-dimethylaminopropylchloride or the hydrochloride salt thereof through an adsorption column packed with activated carbon having a mesh size between 8 to 325 mesh at a treatment level of from 1 to 3500 pounds of 3-dimethylaminopropylchloride or hydrochloride salt thereof per pound of activated carbon.

3,891,709
POLYOXYALKYLENE AMINES
Masaru Higuchi, and Kouichi Ohnaka, both of Ohimachi, Japan, assignors to Daicel, Ltd., Osaka, Japan
Filed June 13, 1973, Ser. No. 369,469
Claims priority, application Japan, June 27, 1972, 47-64316
Int. Cl.[2] C07C *93/10*
U.S. Cl. 260—584 B **4 Claims**

1. An antistatic agent of the formula

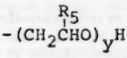


wherein

R_1 is alkyl having from 7 to 29 carbon atoms,

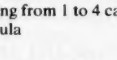
R_2 is H or alkyl having 1 or 2 carbon atoms,

R_3 is lower alkyl having from 1 to 4 carbon atoms or hydroxyalkyl of the formula



in which R_5 is H or alkyl having 1 or 2 carbon atoms and y is an integer of from 1 to 3,

R_4 is lower alkyl having from 1 to 4 carbon atoms or hydroxyalkyl of the formula



in which R_6 is H or alkyl having 1 or 2 carbon atoms and z is an integer of from 1 to 3, and

x is an integer of from 1 to 3.

3,891,710

NOVEL 3-THIA ALKANE-1,4-DIONES

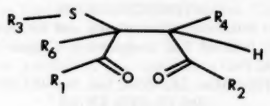
William J. Evers, Atlantic Highlands; Howard R. Heinsohn, Jr., Hazlet, and Bernard J. Mayers, Cliffwood Beach, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 386,454, Aug. 7, 1973, Pat. No. 3,836,563. This application May 1, 1974, Ser. No. 466,066

Int. Cl.[2] C07C *49/04*

U.S. Cl. 260—593 R **3 Claims**

1. A compound having the structure:



wherein R_1 and R_2 are each lower alkyl, R_3 is hydrogen, and each of R_4 and R_6 is lower alkyl or hydrogen.

3,891,711

PRODUCTION OF KETONES

Peter G. S. Field, Bebington, and David A. Lock, Heswall, both of England, assignors to Burmah Oil Trading Limited, Swindon, England

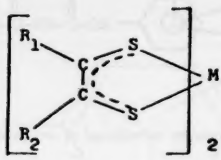
Filed Jan. 21, 1974, Ser. No. 435,035

Claims priority, application United Kingdom, Jan. 24, 1973, 3694/73

Int. Cl. C07c *45/02*

U.S. Cl. 260—597 R **16 Claims**

1. A process for producing a ketone which comprises oxidizing an olefinically unsaturated hydrocarbon containing from three to 24 carbon atoms with an organic hydroperoxide of the formula R′—OOH, wherein R′ is a hydrocarbyl group containing up to 12 carbon atoms and which is unsubstituted or substituted by one or more substituents selected from halogen, alkoxy groups containing up to six carbon atoms, nitro groups and —OOH groups, at a temperature of from ambient temperature to 180°C, in the presence as a catalyst of a metal complex of the formula:



3,891,712

D 2-(6-SUBSTITUTED-2-NAPHTHYL)-PROPANALS

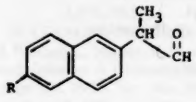
John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama

Continuation of Ser. No. 865,216, Oct. 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012, and a continuation-in-part of Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713. This application Oct. 27, 1972, Ser. No. 301,595

Int. Cl. C07c *47/48*

U.S. Cl. 260—599 **6 Claims**

1. A d 2-(6-substituted-2-naphthyl)propanal selected from the group of compounds represented by the formula



wherein R is methyl, ethyl, isopropyl, cyclopropyl, trifluoromethyl, vinyl, ethynyl, fluoro, chloro, methoxy, methoxymethyloxy, difluoromethoxy, methylthio, methoxymethylthio or difluoromethylthio.

3,891,713

METHOD FOR PRODUCING AROMATIC SULFONES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 10, 1974, Ser. No. 459,484

Int. Cl. C07c *147/06*

U.S. Cl. 260—607 A **9 Claims**

1. The process of reacting an aryl sulfonyl halide with an aromatic substrate to form an aromatic product comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the general formula

wherein R′ is selected from the group consisting of hydrogen, alkyl groups having from 1 to about 6 carbon atoms, alkoxide groups having from 1 to about 4 carbon atoms, hydroxide, aryl and aryloxide groups having from 6 to about 12 carbon atoms including alkyl substituents, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield an arene metal tricarbonyl catalyst having the general formula

charging the reaction vessel with an aryl sulfonyl halide having the general formula R—SO_2—X wherein R is selected from the group consisting of an alkyl group having from 1 to about 20 carbon atoms and an alkyl substituted phenyl group having from 7 to about 12 carbon atoms, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said aryl sulfonyl halide with generation of a sulfonium ion from said organic halide so that said sulfonium ion will attack the remaining part of said aromatic substrate to yield the aromatic product.

3,891,714

PHENOXY CONTAINING BRANCHED CHAIN ALKYL SULFIDES

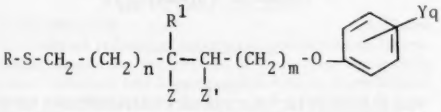
John W. Baum, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 170,387, Aug. 9, 1971, abandoned, and Ser. No. 197,952, Nov. 11, 1971, Pat. No. 3,737,442. This application May 29, 1973, Ser. No. 364,459

Int. Cl.[2] C07C *149/32*

U.S. Cl. 260—609 F **6 Claims**

1. A compound selected from the following formula:



wherein,

m is zero or one;

n is zero, one or two;

R^1 is methyl or ethyl;

R is a branched lower alkyl of three to six carbon atoms;

Y is lower alkyl;

q is zero, one, two or three; and

each of Z and Z' is hydrogen or Z and Z' together form a carbon-carbon bond.

3,891,715

PROCESS FOR POLYMERIZATION OF TETRAHYDROFURAN

Kazuo Matsuda, Wakayama; Yoshiaki Tanaka, Osaka, and Takeyo Sakai, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1972, Ser. No. 307,237

Claims priority, application Japan, Nov. 22, 1971, 46-93933

Int. Cl. C07c *47/02*

U.S. Cl. 260—615 B **4 Claims**

1. A process for the polymerization of tetrahydrofuran which comprises polymerizing tetrahydrofuran at a temperature in the range of −20°C to +10°C, in the absence of water, and in the presence of (1) from 5 to 50 percent by weight, based on the weight of tetrahydrofuran, of fuming sulfuric acid containing from about 15 to about 43 weight percent of SO_3 and (2) from about 0.05 to less than 50 percent by weight, based on the weight of said fuming sulfuric acid, of metal salt of perchloric acid selected from the group consisting of magnesium perchlorate, barium perchlorate, sodium perchlorate, lithium perchlorate and iron perchlorate, until a polymer is formed and then hydrolyzing the terminal groups of the polymer to obtain a polytetramethylene glycol product having hydroxyl groups at both terminal ends of the molecule.

3,891,716

TEREPHENYLYL-BUTADIENOLS

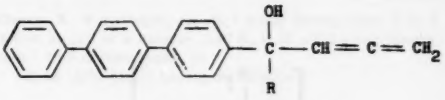
Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1973, Ser. No. 429,401

Int. Cl. C07c *33/02*

U.S. Cl. 260—618 R **2 Claims**

1. A compound of the formula



wherein

R is a hydrogen atom, methyl or ethyl.

3,891,717

PREPARATION OF O-CHLOROPHENOLS

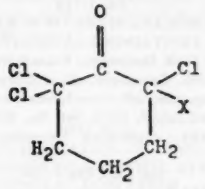
Eugene C. Gilbert, Hanover Park; Robert E. Jones, Arlington Heights, both of Ill., and Edward Sherman, Genoa City, Wis., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 115,772, Feb. 16, 1971. This application Mar. 11, 1974, Ser. No. 449,710

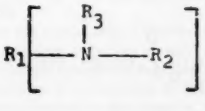
Int. Cl. C07c *39/27, 39/30*

U.S. Cl. 260—623 R **14 Claims**

1. A process for making an ortho chlorinated phenol which comprises: contacting a chlorinated alicyclic ketone and a nitrogen-containing catalyst at a temperture between 100°C. and 250°C; said ketone of the general formula:

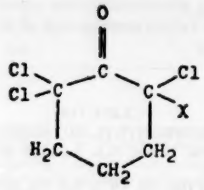


wherein X is hydrogen or chlorine; said nitrogen-containing catalyst being selected from the group consisting of collidine, pyridine, quinoline, lutidine, picoline, pyrazine, a compound of the formula:

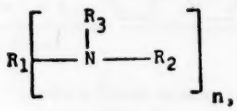


and acid salts thereof selected from the group hydrochloric acid salts and acetic acid salts; wherein *n* is a whole integer 1 or 2; R_1 is alkyl having between 1 and 4 carbon atoms, phenyl, or acyl selected from the group formyl, acetyl and propionyl when *n* is 1, and R_1 is carbonyl when *n* is 2; and R_2 and R_3 are independently either a hydrogen or alkyl having between 1 and 4 carbon atoms, or phenyl or alkyl substituted phenyl.

9. The process for making an ortho chlorinated phenol which comprises contacting a chlorinated alicyclic ketone of the general formula:



wherein X is a hydrogen or a chlorine with a nitrogen-containing catalyst which is a meteroaromatic amine a compound of the formula:



wherein n is a whole integer 1 or 2; R_1 is an alkyl, phenyl, or acyl group when n is 1, and R_1 is a carbonyl group when n is 2; and R_2 and R_3 are independently either a hydrogen, phenyl or alkyl group, said contacting taking place at a temperature between 100°C. and 250°C., said phenyl being unsubstituted and alkyl substituted, said alkyl having from 1 to 4 carbon atoms, said acyl having from 1 to 3 carbon atoms.

3,891,718

SHAPED ARTICLES MADE OF ACRYLONITRILE POLYMERS CONTAINING ANTISTATIC ADDITIVES

Gerhard Dieter Wolf, Dormagen; Francis Bentz, Cologne, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

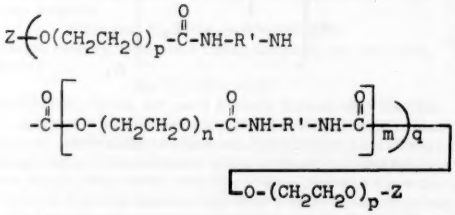
Filed July 5, 1974, Ser. No. 486,186

Claims priority, application Germany, July 7, 1973, 2334602

Int. Cl. C08g *41/04*

U.S. Cl. 260—859 R **5 Claims**

1. A shaped article of an acrylonitrile polymer containing at least 60% by weight of acrylonitrile in copolymerized form containing as an antistatic additiv from 0.5 to 15 % by weight, based on the total mixture, of at least one polyether polyurethane compound of the general formula



in which

Z represents the radical

or R, where R denotes a C_{1-18}-alkyl, cycloalkyl, aryl, aralkyl or alkaryl radical said radical being substituted by halogen or alkyl or not,

R′ represents an alkylene, cycloalkylene, arylene, aralkylene or alkarylene radical, said radical being substituted by halogen or alkyl or not,

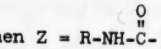
p and n denote integers of from 5 to 50 being identical

or different (when Z = R) and

m represents an integer of from 0 to 10 when Z denotes the group

or it represents an integer of from 1 to 10 when Z denotes the group R, and

q represents the integer 1 (when Z = R) or an integer of from 0 or 1



3,891,719

THERMOPLASTIC MOULDING COMPOSITIONS OF A POLYCARBONATE AND A GRAFT COPOLYMER OF STYRENE AND ACRYLONITRILE ON AN ACRYLIC ACID ESTER POLYMER

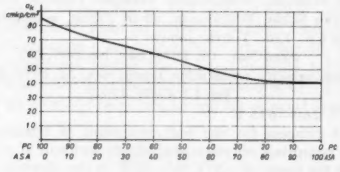
Hermann Schirmer, Krefeld; Gunter Peilstocker, Krefeld-Bockum, and Herbert Schuster, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Dec. 3, 1973, Ser. No. 421,645

Claims priority, application Germany, Dec. 6, 1972, 2259564; Oct. 25, 1973, 2353429

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 **8 Claims**



1. A thermoplastic moulding composition comprising: a. from 95 to 5 % by weight of a dihydric phenol polycarbonate; and b. from 5 to 95 % by weight of a graft styrene and acrylonitrile copolymer on an acrylic acid ester homopolymer and/or copolymer.

3,891,720
GRAFT POLYMERS OF VINYL CHLORIDE ON UNSATURATED OLEFINIC ELASTOMERS AND PROCESS FOR THE PREPARATION THEREOF

Febo Severini; Alberto Valvassori, both of Milan, and Alberto Pagliari, Saronno, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Sept. 25, 1972, Ser. No. 292,159
Claims priority, application Italy, Sept. 23, 1971, 28984/71
Int. Cl. C08f *15/00, 29/12*
U.S. Cl. 260—878 R **11 Claims**

1. An impact resistant polymeric composition comprising a mixture of the following components:

a. a vinyl chloride homopolymer,

b. a graft copolymer of 15–60% by weight of vinyl chloride on an olefinic elastomer which comprises a copolymer of ethylene, an α-olefin and a minor amount of a cyclic or acyclic diene or polyene, and

c. an unmodified olefinic elastomer;

said composition having a melt index (determined according to ASTM D 1238 at 185°C with a load of 23.5 kg) greater than 1 when the composition contains from 5 to 15% of total rubber, which is defined as the sum of the amounts of olefinic elastomer contained in components (b) and (c).

3,891,721
BLOCK POLYMERS OF STYRENE-BUTADIENE-2-VINYLPYRIDINE

Robert T. Prudence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 15, 1973, Ser. No. 415,870
Int. Cl. C08d *1/20, 3/06*
U.S. Cl. 260—879 **6 Claims**

1. A triblock polymer of polystyrene-polybutadiene-2-vinylpyridine formed by the process of contacting sequentially styrene, butadiene and 2-vinylpyridine with an organolithium catalyst corresponding to the formula R-Li wherein R is selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aryl alkyl and characterized by the molecular weight of the polystyrene block ranging from about 10,000 to about 15,000, the molecular weight of the polybutadiene block ranging from about 30,000 to about 80,000 and the molecular weight of the poly-2-vinylpyridine block ranging from about 5,000 to about 15,000, and further characterized in that the ultimate tensile of the triblock polymer is at least 5200 psi, displays at least 650 percent elongation and the end blocks of polystyrene and poly-2-vinylpyridine together comprise at least 30 percent by weight of the said triblock polymer molecular weight.

3,891,722
PROCESS FOR MANUFACTURE OF IMPACT-RESISTANT POLYMERIZATES OF OLEFINIC NITRILES AND DIENE RUBBERS

William J. Miloscia, Macedonia; John J. Weisz, Solon, and Paul E. Planz, North Randall, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Feb. 16, 1970, Ser. No. 11,924
Int. Cl. C08f *15/36, 15/40*
U.S. Cl. 260—879 **5 Claims**

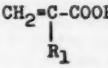
1. In the process for preparing an impact-resistant resinous polymer comprising polymerizing in an aqueous medium in the substantial absence of oxygen and in the presence of a polymerization initiator and a polymer modifier 100 parts by weight of

A. at least 50% by weight of at least one nitrile having the structure

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms or a halogen and

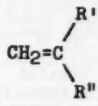
B. up to 50% by weight based on the combined weight of (A) and (B) of

1. an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms, or

2. an alpha-olefin having the structure



wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms in the presence of from 1 to 40 parts by weight of

C. a rubbery polymer of a conjugated diene and a comonomer having the structure

wherein R has the foregoing designation, said rubbery polymer containing from 50 to 90% by weight of polymerized conjugated diene and from 10 to 50% by weight of comonomer,

the improvement consisting of carrying the polymerization reaction to at least about 5% conversion before adding any of the polymer modifier.

3,891,723
EMULSION POLYMERIZATION OF VINYL CHLORIDE, AND A COPOLYMER OF α-METHYL STYRENE AND ACRYLIC ACID ESTER

Rene Nicolet, and Walter Gutmann, both of Fribourg, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed June 8, 1973, Ser. No. 368,100
Claims priority, application Switzerland, June 8, 1972, 8491/72
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—884 **16 Claims**

1. A process for the production of transparent impact-resistant and weather-resistant polymers of vinyl chloride by polymerizing vinyl chloride, optionally together with other copolymerisable monomers, in an aqueous dispersion by an emulsion polymerisation process in the presence of copolymers of acrylic acid esters, characterised in that vinyl chloride or monomer mixtures containing at least 80 percent by weight of vinyl chloride are polymerised in the presence of a dispersion of at least one copolymer of 65 to 95 percent by weight of at least one acrylic acid ester containing 3 to 18 carbon atoms in the ester group with 35 to 5 percent by weight of α-methyl styrene, the copolymer having a mean particle diameter of 30 to less than 120 mμ, determined by soap titration, and being used in such an amount that the final polymer contains 4 to 20 percent by weight of acrylic acid ester units.

3,891,724

ETHYLENE-PROPYLENE TERPOLYMER AND CRYSTALLINE 1,2 POLYBUTADIENE

Yasuyuki Yaeda; Yoshishige Chikatsu; Noriaki Ando, all of Yokkaichi, and Ryuichi Sakata, Kobe, all of Japan, assignors to Japan Synthetic Rubber Co., Limited, Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,851

Claims priority, application Japan, Dec. 12, 1972, 47-124680

Int. Cl. C08f *29/12, 45/54*

U.S. Cl. 260—889 **9 Claims**

1. An ethylene-propylene rubber composition comprising 3 to 50 % by weight of at least one 1,2-polybutadiene having a 1,2-addition unit content of at least 70 %, a crystallinity of at least 5 % and an intrinsic viscosity of at least 0.7 dl/g as measured in toluene at 30°C, and 97 to 50 % by weight of at least one ethylene-propylenediene terpolymer rubber.

3,891,725

VULCANIZABLE CHLORINATED ELASTOMER COMPOSITION

Harold Howard Klever, Munroe Falls, Ohio, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 4, 1974, Ser. No. 512,045

Int. Cl. C08f *29/12, 37/18*

U.S. Cl. 260—889 **8 Claims**

1. In a vulcanizable composition of a chlorinated hydrocarbon elastomer selected from the group consisting of chlorinated polyethylene, chlorosulfonated polyethylene, or chloroprene polymers, the improvement which comprises said chlorinated hydrocarbon elastomer containing from about 3–20 parts, based on 100 parts of chlorinated elastomer, of a sulfur-curable copolymer having ethylene units, propylene units, units derived from a monoreactive non-conjugated diene having only one polymerizable double bond, and units derived from a C_3—C_{22} direactive nonconjugated diene having two polymerizable double bonds.

3,891,726

HETEROCYCLIC PHOSPHORUS COMPOUNDS

John Scotchford Elliott; Bryan Terence Davis, and Monty Frederick Crook, all of London, England, assignors to Edwin Cooper & Company Limited, London, England

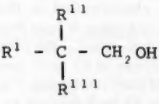
Filed Feb. 13, 1973, Ser. No. 332,125

Claims priority, application United Kingdom, Feb. 18, 1972, 7582/72

Int. Cl.² C07F *9/32*

U.S. Cl. 260—927 R **5 Claims**

1. A heterocyclic phosphorus mono- or polyester product prepared by reacting a polyol of the formula:



wherein R^1 is selected from the group consisting of hydrogen, methyl, ethyl, methylol, the group $-O-R''''-O_vH$ where R'''' is ethylene or propylene and v is zero or an integer of from 1 to 10, and

R'' and R''' are the same or different and each is selected from the group consisting of hydrogen, methyl, ethyl and methylol, and the combination of R', R'' and R''' is such that at least two hydroxyl groups are present; or a monoether, oxide, oxetane or carbonate which yields said polyol on hydrolysis; with a heterocyclic phosphorus compound prepared by reacting an olefin polymer or copolymer having a molecular weight in the range of about 700 to 3500 and containing olefinic unsaturation with a phosphorus trihalide in the presence of a Friedel-Crafts catalyst to form a reaction product having hydrocarbon and halogen attached to phosphorus, and thereafter reacting the reaction product with water or methanol to remove one or both of the halogen atoms from the phosphorus atom.

3,891,727

FIRE RETARDANT PHOSPHORUS OLIGOMER COMPOSITIONS

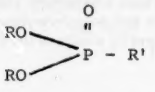
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. Nos. 153,075, June 14, 1971, Pat. No. 3,822,327, Ser. No. 187,575, Oct. 7, 1971, and Ser. No. 410,583, Oct. 29, 1973. This application Dec. 17, 1973, Ser. No. 425,675

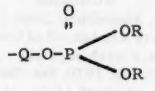
Int. Cl. C07f *9/08;* **C07d** *105/04;* **C08f** *45/58*

U.S. Cl. 260—928 **34 Claims**

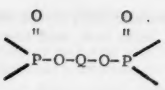
1. Condensation products of a phosphorus ester material comprising a phosphorus ester of the formula



wherein R is 2-haloalkyl of 2 to 20 carbon atoms or alkyl of from 1 to 20 carbon atoms, aryl, aralkyl, alkaryl, alkenyl of from 2 to 20 carbon atoms, alkadienyl, alkynyl, cycloalkyl, cycloalkenyl, cycloalkadienyl, aralkenyl, and the alkoxy, aryloxy, cyano and haloaryl substituted derivatives thereof or:



wherein Q represents vicinal carbon atoms of an alkylene radical containing from 2 to 20 carbon atoms, and R' is R or OR, with the proviso that at least one R in the above formula is a 2-haloalkyl radical, said condensation products being essentially free of five-membered phosphorus ester rings and being prepared by a process comprising heating to a temperature between about 100° and about 250°C. said phosphorus ester material, removing alkyl halide, forming:



linkages wherein Q is as defined above and five-membered phosphorus ester rings, and converting said rings to open chain phosphorus esters by reaction at a temperature from about 20° to about 180°C. with a reagent of formula:

YOH

in which Y is hydrogen, alkyl of from 1 to 20 carbon atoms or alkyl of from 1 to 20 carbon atoms substituted with non-interfering substituents selected from the group consisting of aryloxy, halogen, alkoxy, alkenyl, aryl, acyl, acyloxy, hydroxyl, amido, alkylthio, arylthio, carbalkoxy, carboxamido, cyano or nitro.

2. Condensation products according to claim 1 obtained by a process comprising the additional step of substantially neutralizing the acid structures by heating at a temperature from about 25° to about 225°C. the condensation product with an epoxide selected from the group consisting of C_2–C_8 alkylene oxides, epichlorohydrin, epibromohydrin, styrene oxide, glycidyl ether cyclohexenylmethyl cyclohexene carboxylate diepoxide, butadiene diepoxide, vinyl cyclohexene diepoxide, 4,4,4-trichloro-1,2-epoxybutane or an ortho ester selected from the group consisting of radicals having the formula:

$$-C(OR)_3$$

wherein R is alkyl of from 1 to 6 carbon atoms.

3,891,728
O-ALKYL-S-ALKYL-O-SUBSTITUTED PHENYL-THIOPHOSPHORIC ACID ESTERS

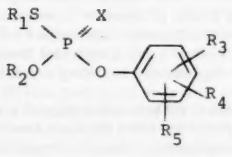
Jozef Drabek, Allschwil, and Denis Varsanyi, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 292,218, Sept. 25, 1972, Pat. No. 3,839,509. This application July 15, 1974, Ser. No. 488,867

Int. Cl. A01n *9/36;* **C07f** *9/18*

U.S. Cl. 260—955 **3 Claims**

1. A compound of the formula



wherein

R_1 is C_3–C_5 alkyl,

R_2 is methyl or ethyl,

R_3 is trihalomethyl in which at least 1 halogen is fluorine,

R_4 and R_5 are each independently hydrogen, chlorine or bromine, and

X is oxygen or sulphur.

3,891,729
DEVICE FOR AERATING LIQUIDS

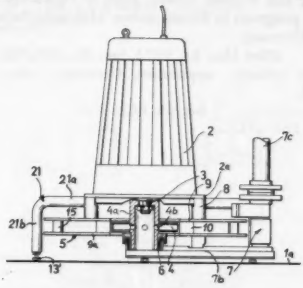
Heinrich Ebner, Bonn-Ippendorf, and Anton Enenkel, Bonn-Roettgen, both of Germany, assignors to Firma Heinrich Frings, Bonn, Germany

Filed Aug. 31, 1973, Ser. No. 393,439

Claims priority, application Germany, Sept. 1, 1972, 2243161

Int. Cl. B01f *3/04*

U.S. Cl. 261—87 **12 Claims**



1. A device for aerating liquids, which device includes a hollow vaned rotor arranged near the bottom of a tank or container for rotation about a vertical axis, a stator encircling said rotor, and a drive motor for rotating said rotor, the latter having from 4 to 8 vanes, each vane being provided at its trailing side with an air outlet opening facing away from the direction of rotation of the rotor and at its leading side with a vertical imperforate impeller facing in in the direction of rotation and inclined non-radially away from said direction so as to form an acute angle with a radial plane extending through the apex edge of that vane, said rotor thereby having a like plurality of peripherally spaced chambers defined between successive vanes and each open at both its top and its bottom, and the stator having 2 vertically spaced, flat horizontal rings and at least 12 vertical guide plates secured between said rings at peripherally spaced locations and each inclined non-radially of the rotor/stator combination so as to form an acute angle with a radial plane passing through the innermost edge of that guide plate; the improvement wherein

a. said rotor has a vertical, downwardly open, tubular hub the interior of which is in communication with the interior of said rotor;

b. said drive motor is constructed for immersion in the liquid being aerated, is positioned above said rotor and in close proximity thereto, and has a short output shaft drivingly connected to said hub;

c. spacer means are interposed between and rigidly connected to both the upper one of said stator rings and an adjunct of the superposed housing of said drive motor, thereby to provide above said rotor between said upper stator ring and said drive motor housing a space of predetermined height through which liquid can flow in a controlled manner to enter from above into said chambers defined between said rotor vanes;

d. a stationary air intake duct which has an intake end located exteriorly of said tank or container and laterally adjacent thereto extends from there into said tank or container and then first downwardly to a level below that of said rotor and then transversely over to the lowermost end of said hub, said air intake duct at its discharge end is in communication with the interior of said hub, and a labyrinth packing or like rotary coupling establishes a liquid-tight seal between said hub and said discharge end of said air intake duct; and

e. a supporting structure for the entire device is provided with a plurality of leveling screws resting on the bottom of said tank or container, said supporting structure being constructed and arranged to dispose the lower one of said

stator rings so as to leave sufficient space therebelow to accommodate the transverse section and the discharge end section of said air intake duct and to permit liquid to enter from below into said chambers.

3,891,730

METHOD FOR MAKING METAL POWDER

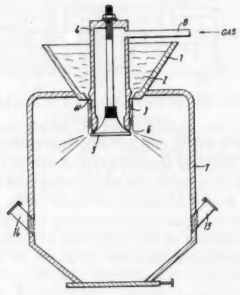
Otto Wessel, Duisburg; Georg Hofmann, Krefeld; Hartmut Gesell, and Werner Scholz, both of Duisburg, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed May 24, 1972, Ser. No. 256,386

Claims priority, application Germany, May 27, 1971, 2126856

Int. Cl. B01j *2/02*

U.S. Cl. 264—11 **3 Claims**



1. In a method for producing metal powder by atomizing molten metal upon impact by a pressurized atomizing fluid and permitting resulting droplets to cool and to solidify, the improvement comprising:

a. causing said molten metal to flow as a downflowing film over the outer surface of a hollow mandrel and leaving the lower end of said mandrel as an annular stream; and

b. directing said pressurized fluid through said mandrel and as radially outward jet flow from the lower end of said mandrel to impinge upon and atomize the surrounding annular stream of molten metal into droplets and to displace said droplets in radial outward directions from said mandrel.

3,891,731

METHOD OF PRE-STRESSING FORM TIE SYSTEMS

Chester I. Williams, 347 Greenbriar, S.E., Grand Rapids, Mich. 49506

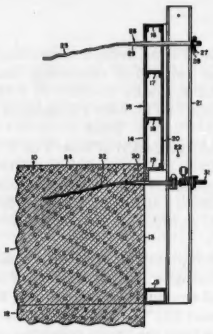
Filed Oct. 20, 1969, Ser. No. 867,508

Int. Cl. E04g *11/28*

U.S. Cl. 264—33 **4 Claims**

1. A method of securing a form structure to an existing mass of concrete, said method including attaching in threaded engagement an anchor rod to a dummy bolt mounted in a form panel and projecting inwardly therefrom, pouring concrete around said anchor rod and the inner extremity of said dummy bolt device, removing said dummy bolt, attaching a stress bolt to said anchor in threaded engagement, and securing a form panel for the succeeding pour by securing the same to said stress bolt, wherein the improvement comprises:

generating predetermined pre-stress in said anchor rod at least to the extent of the working load to be applied thereto by tightening the threaded engagement of said stress bolt therewith prior to the securing of said form panel to said stress bolt, said stress bolt remaining in



axially substantially fixed position with respect to said concrete mass during said generation of pre-stress.

3,891,732

METHOD OF SEALING SHUTTERING AGAINST A DEFORMABLE SECTION OF AN EXTERNAL WATERSTOP FOR USE IN FORMING JOINTS IN CONCRETE

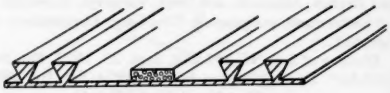
John Hurst, London, England, assignor to W. R. Grace & Company, Cambridge, Mass.

Division of Ser. No. 328,994, Feb. 1, 1973, Pat. No. 3,808,762, which is a division of Ser. No. 217,676, Jan. 13, 1972, Pat. No. 3,758,650, which is a continuation of Ser. No. 4,379, Jan. 20, 1970, abandoned. This application Jan. 9, 1974, Ser. No. 431,808

Claims priority, application United Kingdom, Jan. 22, 1969, 3699/69

Int. Cl. E04b *1/16*

U.S. Cl. 264—34 **3 Claims**



1. The method of forming a water-impervious seal at a concrete joint formed by two adjacent and separately poured masses of concrete, said method comprising the steps of:

1. providing a strip of moisture or water-resistant flexible material not sufficiently deformable by shuttering placed thereon to effect a grout-tight seal therewith, said strip having a longitudinally extending center line, and at least one keying formation projecting laterally from said strip on each side of the center line thereof, said keying formations all projecting from the same face of said strip and running longitudinally along the length thereof, said keying formations being structured such that the formations broaden out from the point at which they project from said strip, said strip further having substantially at said center line a raised, foam portion having a plurality of closed cells more easily deformable than said strip and running longitudinally along the length of said strip and projecting laterally from the same surface as said keying formations; said foam portion being sufficiently deform-

able by shuttering placed thereon to effect a grout-tight seal therewith;

2. placing the surface of said strip which is opposite to the surface from which said formations project against a base or shuttering, on or against which base or shuttering said concrete masses are to be poured;

3. placing stop-end shuttering against said deformable section of said strip whereby said section is deformed by the pressure of said stop-end shuttering and conform tightly in sealing relationship to the configuration of said shuttering;

4. pouring a first mass of concrete so that the or each keying formation on one side of the center line of said strip becomes embedded in the concrete; removing said shuttering; and

5. pouring a second mass of concrete so that the exposed keying formation or formations on the opposite side of said center line of said strip becomes embedded therein.

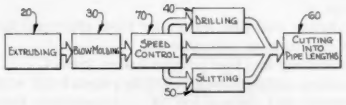
3,891,733
METHOD OF MAKING CORRUGATED PLASTIC PIPE WITH INTEGRAL COUPLER COLLARS

Ernest J. Maroschak, Box 878, Roseboro, N.C. 28382

Filed July 13, 1972, Ser. No. 271,225

Int. Cl.[2] **B29C** *5/06*; **B29D** *23/03, 23/04*

U.S. Cl. 264—40 **20 Claims**



1. A method of making plastic pipes each having an elongate tubular corrugated body and an integral enlarged coupler collar on one end of each body; said method comprising

continuously extruding a tube of hot plastic material into a blow molding zone defined by a series of cooperating pairs of forwardly moving die blocks, while

molding annular corrugations of alternating ribs and valleys along successive closely spaced, elongate portions of the tube to produce predetermined corrugated lengths of the tube during forward movement thereof through the molding zone, while also

molding each of those portions of the tube between the corrugated lengths into an enlarged relatively short sleeve of an inner shape and size capable of circumscribing a circle of a diameter greater than the outer diameter of the ribs during forward movement of the tube through the molding zone, and while molding a plurality of spaced latch members integral with and projecting inwardly around the interior of each sleeve adjacent opposite sides of the median longitudinal center thereof and wherein the latch members are of such size and shape as to fit in at least one valley of a cut-end portion of the corrugated lengths,

transversely severing said tube intermediate the ends of the respective sleeves to form each sleeve into a pair of separate collars integral with and projecting axially from the proximal ends of adjacent corrugated lengths so that some of said latch members are positioned within both of the separate collars formed by severing each sleeve, and transversely severing each of said corrugated lengths intermediate the ends thereof so that each pipe thus formed has a collar on one end only thereof adapted to receive therein the corrugated opposite end portion of anoter like pipe.

3,891,734
PROCESS FOR THE MANUFACTURE OF LIGHT GRANULATES

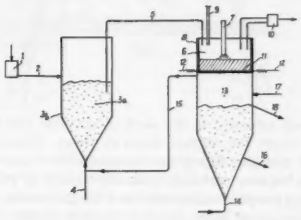
Raymond Chauvin, Verneuil-en-Halatte, France, assignor to Charbonnages de France, Paris and Houilleres du Bassin du Nord et du Pasde-Calais, Douai, both of, France

Continuation-in-part of Ser. No. 159,275, July 2, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,345

Claims priority, application France, July 10, 1970, 70.25915

Int. Cl. C04b *33/32, 35/64*

U.S. Cl. 264—43 **12 Claims**



1. A process for the manufacture of lightweight aggregate from fusible silico-aluminous mineral capable of evolving gases by internal reaction of disassociation, comprising the following steps:

a. melting at a temperature between 700° and 1,550°C. said fusible silico-aluminous material, selected from the group consisting of shale, fusible clay and ash, in an atmosphere at a pressure in the vicinity of the atmospheric pressure,

b. restraining the release of liberated gas from the melt by maintaining above the melt the partial pressure of at least one of the gases normally liberated from the molten mineral at an elevated pressure no lower than the pressure at which said gas is formed in the resultant molten mineral, said gases being selected from the group consisting of oxygen, carbon dioxide, carbon monoxide, sulfur dioxide-trioxide;

c. dividing said molten mineral into drops of 3 to 15 mm;

d. simultaneously bringing said drops into contact with an atmosphere, different from said controlled atmosphere, wherein the partial pressure of said evolving gas is reduced to the vicinity of zero, thereby expanding said drops; and

e. rapidly cooling the expanding drops to effect freezing of said drops to thereby form cooled expanded granules.

3,891,735
SINTERED ARTEFACTS AND THE LIKE

John Malcolm North, and Ronald Spencer Wilks, both of Newbury, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 27, 1972, Ser. No. 318,747

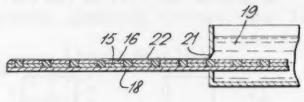
Claims priority, application United Kingdom, Dec. 29, 1971, 60575/71

Int. Cl. C04b *35/64*

U.S. Cl. 264—59 **2 Claims**

1. In a method of manufacturing a sintered artefact or like artefact the manufacture of which involves firing a refractory material, which method comprises stacking layers of sheet material capable of burning readily and without deleterious ash formation, with intervening layers of composite plastics material in preformed sheets comprising powdered refractory material and a binder which provides thermosetting properties, providing ribs or walls of composite plastics material and effecting bonding such that the ribs or walls connect together

the sheets of composite plastics material, the thickness of the layers of burnable material defining the separation between adjacent sheets of composite plastics material, heating the stack to cure the binder, further heating to burn off the burnable material, and firing the stack to form the sintered or like artefact from the powdered refractory material, a method of fabricating a sheet component comprising securing a sheet of said readily burnable material to a support sheet with adhesive, forming said adhesively secured readily burnable sheet and support sheet with slots corresponding to wanted structural features in a finished aretfact, securing a further support



sheet with adhesive to the slotted burnable sheet on the side remote from the slotted support sheet, whereby the slots become troughs, filling the troughs with a mixture of powdered refractory material, a binder capable of providing thermosetting properties and a solvent for the binder, evaporating the solvent, and removing the support sheets, the resultant composite plastics material comprising powdered refractory material and binder extending through the slots at least to the surface on each side of the slotted sheet of burnable material so as to form said ribs or walls, said adhesive being insoluble in said solvent for the binder.

3,891,736

PROCESS FOR SHAPING POLYTETRAFLUOROETHYLENE SHEET

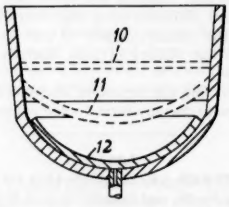
Arthur Trevor Voaden, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 8, 1971, Ser. No. 187,648

Claims priority, application United Kingdom, Oct. 16, 1970, 49285/70; Jan. 26, 1971, 3166/71

Int. Cl. B29c *17/04*

U.S. Cl. 264—92 **5 Claims**



1. A process for the manufacture of shaped articles of polytetrafluoroethylene wherein a sheet of polytetrafluoroethylene is heated to a temperature at which it is shapeable by fluid pressure and is positioned wholly inside a concave mold essentially free of convex portions and is subjected to the effect of atmospheric pressure across substantially the whole of its surface directed away from the mold cavity by the application of an at least partial vacuum between the sheet and the mold so as to cause the sheet to conform to the shape of the mold surface by the free drawing-in of the sheet into the mold during which the periphery of the sheet is allowed to move freely over the mold surface without restraint, the sheet being subsequently held in the mold until it has cooled sufficiently to be form stable.

3,891,737

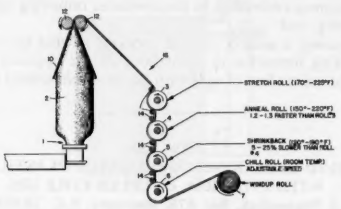
METHOD OF MAKING A HEAT SHRINKABLE FILM OF POLYETHYLENE COPOLYMERS THEREOF AND ARTICLE PRODUCED THEREFROM

Alexander J. Marsh, Republic, and Henry O. Sargent, Harrisonburg, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 21, 1973, Ser. No. 419,164

Int. Cl. B29c *17/02, 17/07, 25/00*

U.S. Cl. 264—95 **1 Claim**



1. A method of making a preferentially oriented heat shrinkable film of polyethylene or polyethylene containing copolymers thereof having a shrink characteristic generally controlled by the heat applied to effect shrinking compring the steps of

a. inflating said film in tubular form after said film is extruded from an extrusion die,

b. collapsing said film without fusion thereof,

c. passing said collapsed film over a stretch roll while maintaining said stretch roll at a temperature from about 170°F. to about 225°F.,

d. stretching said film along its longitudinal axis by a factor between about 1.2:1 and 1.3:1 by effecting a speed differential of said factor between said stretch roll and an anneal roll,

e. maintaining the temperature of said anneal roll from about 150°F. to about 220°F. to anneal said film,

f. effecting shrinking back of said film between said anneal roll and a shrink back roll by driving said shrink back roll at a speed from about 5% to about 25% slower than said anneal roll,

g. maintaining the temperature of said shrink back roll from about 120°F. to about 190°F.,

h. cooling said film to about room temperature,

i. and winding up said film on a windup roll.

3,891,738

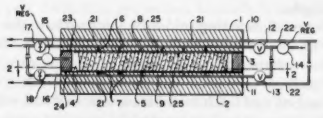
METHOD AND APPARATUS FOR PRESSING PARTICLEBOARD

Kuo-Cheng Shen, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Nov. 10, 1972, Ser. No. 305,531

Int. Cl.[2] **B29J** *5/00*

U.S. Cl. 264—101 **5 Claims**



1. A process for pressing particleboard in a press including a pair of platens wherein each platen has apertures opening to one surface thereof which is adjacent to the other platen and

chamber defining means enclosing the region between said platens, comprising the steps of:

a. compressing a mat comprising wood particles and a thermosetting adhesive binder between said platens to the desired particleboard thickness;

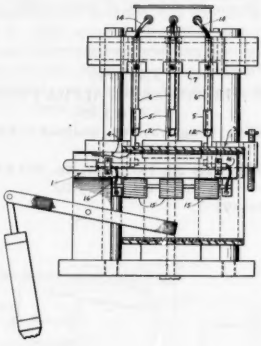
b. introducing steam under pressure into the compressed mat through the apertures of one platen with sufficient pressure to pass through the mat from one surface thereof to the other surface thereof, and exhausting the steam through the apertures of the other platen, restricting the exhaust rate to provide an elevated and substantially uniform pressure and temperature condition within the chamber while steam is passed through the mat, for a length of time sufficient to cure the adhesive binder; and

c. releasing the steam pressure from the chamber and separating the platens for removal of the particleboard.

3,891,739
METHOD OF FORMING PRECISELY DIMENSIONED APERTURES

Richard Lawson, Lafayette, N.J., assignor to Ames Rubber Corporation, Hamburg, N.J.

Filed Oct. 1, 1974, Ser. No. 511,084
Int. Cl.[2] B29C *17/10*
U.S. Cl. 264—155 **3 Claims**

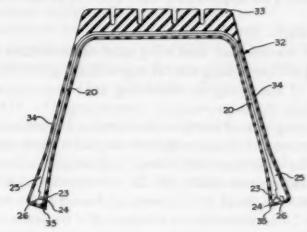


1. The method of forming a precisely dimensioned aperture in a coating of elastomeric material on the cylindrical surface of a hollow rigid roller having a preformed aperture therein of given contour and dimensions, which comprises preheating a die of similar contour and dimensions to a predetermined temperature sufficient to melt said elastomeric material, passing said heated die through said coating and through said preformed aperture to form an aperture in said coating in register with said preformed aperture which conforms roughly to the contour and dimensions of said preformed aperture, reheating said die to said predetermined temperature, and again passing said reheated die through said apertures in the reverse direction to reform the aperture in said coating to the precise contour and dimensions of said preformed aperture.

3,891,740
METHOD FOR FORMING AN INJECTION MOLDED TIRE USING MOLDED REINFORCING PLIES

Frederick F. Vannan, Jr., Danville, Va., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 5, 1972, Ser. No. 250,702
Int. Cl. B29h *17/00*
U.S. Cl. 264—263 **6 Claims**

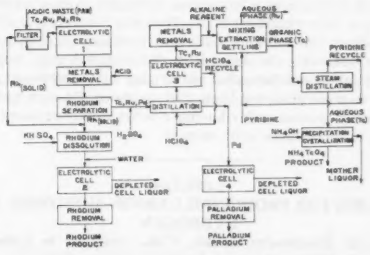


1. A method of building a tire consisting essentially of molding a ply of the desired angle, placing at least one ply in a tire mold in the desired spaced relationship relative to the tire mold and any other ply present in the mold to leave a space between the other ply and the tire mold when closed and positioning a bead portion of said one ply in a corresponding recess of said second ply to lock the plies together, filling said space with an elastomeric precursor and heating to set the precursor around each ply to give a cured tire when removed from the tire mold.

3,891,741
RECOVERY OF FISSION PRODUCTS FROM ACIDIC WASTE SOLUTIONS THEREOF

William W. Carlin, Portland; William B. Darlington, and Donald W. Dubois, both of Corpus Christi, all of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1972, Ser. No. 309,377
Int. Cl. C01g *55/00, 57/00*
U.S. Cl. 423—2 **23 Claims**



1. A process for separating rhodium, palladium and technetium from aqueous, acidic solutions containing said metal values and other fission product metal values said solution resulting from processing irradiated nuclear fuel, which comprises electrolyzing said solution having an acid concentration no greater than about 1 molar in an electrolytic cell under controlled cathodic potential conditions and at a potential at which rhodium, palladium and technetium are deposited on the cathode of the cell, removing metal depleted waste solution from the cell, dissolving metal deposited on the cathode in strong acid to provide an acid solution of deposited metal values, and separating undissolved rhodium metal from the solution.

3,891,742
METHOD OF PURIFYING GASES CONTAINING ACID IMPURITIES USING STABILIZED 2-(2-AMINOETHOXY)ETHANOL

Ernest Leon Yeakey, and Philip Hotchkiss Moss, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Division of Ser. No. 350,003, April 11, 1973, Pat. No. 3,829,494. This application Apr. 10, 1974, Ser. No. 459,547
Int. Cl. B01d *47/00*
U.S. Cl. 423—229 **6 Claims**

1. In a method for removing impurities of acid gases from natural gas comprising contacting natural gas with a material capable of adsorbing or absorbing said impurities from said natural gas, the improvement comprising:

employing as said material an improved composition having improved resistance against degradation in the presence of the acid gas impurities, said improved composition consisting essentially of 2-(2-aminoethoxy)ethanol and from 1 to about 50 wt. percent, based upon the weight of said 2-(2-aminoethoxy)ethanol of a trialkanolamine, said trialkanol-amine being a tri(lower alkanol)amine having 2 to about 4 carbon atoms per lower alkanol group.

3,891,743
FREE-FLOWING SULFUR PRODUCT

Michael J. Block, and Donald C. Young, both of Fullerton, Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Aug. 30, 1972, Ser. No. 285,040
Int. Cl. C01b *17/02*
U.S. Cl. 423—267 **8 Claims**

1. A method for producing finely ground sulfur free of any tendency to form cakes upon storage from sour gas sulfur having the tendency to form cakes on storage and containing hydrogen sulfide in an amount up to about 0.1 weight percent and sufficient to cause the formation of said cakes upon storage of finely ground sulfur prepared directly from said sour gas sulfur, which method comprises contacting said sour gas sulfur in a molten state and at a temperature from 119° to about 200°C. with a hydrogen sulfide oxidizing agent selected from the class consisting of nitric acid, sulfuric acid, perchloric acid, sulfur dioxide, molecular oxygen, nitric oxide, nitrogen dioxide, nitrogen tetroxide, ozone and mixtures thereof in amounts from about 0.2 to about 10 weight parts of oxidizing agent per 100 weight parts of sulfur, and for a period of from 1 to about 500 minutes sufficient to oxidize said hydrogen sulfide, removing the sulfur from the oxidation step, solidifying the sulfur and thereafter pulverizing and comminuting the sulfur to a particle size from .001 to about .01 inch to form said finely ground sulfur having a substantially reduced tendency to form cakes upon storage.

3,891,744
PROCESS FOR PRODUCING CARBON MONOXIDE AND HYDROGEN

Glenn E. Handwerk, Golden, Colo., assignor to Colorado School of Mines Research Institute, Golden, Colo.

Filed Sept. 12, 1973, Ser. No. 396,498
Int. Cl. C01b *31/00, 15/16, 1/00*
U.S. Cl. 423—415 **33 Claims**

1. A continuous process for the production of carbon monoxide and hydrogen which comprises the following steps:

a. oxidizing elemental phosphorus by contacting it with steam at a temperature between about 500°F – 1400°F to produce hydrogen, and phosphorus oxides;

b. separating the gaseous hydrogen and phosphorus oxides and recovering them;

c. reducing the phosphorus oxides with carbon or carbonaceous material at a temperature between about 1500°F and the softening point of the ash contained in the carbon or carbonaceous material to form carbon monoxide and elemental phosphorus;

d. separating the carbon monoxide and phosphorus formed in step (c) and recovering them; and

e. recycling the phosphorus recovered in step (d) to step (a) for reuse in the continuous process.

3,891,745
PROCESS FOR PRODUCING BASIC ALUMINUM CHLORIDES

Alfred Bellan, and Klaus Deneke, both of Luisdorf, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Continuation of Ser. No. 184,221, Sept. 27, 1971, abandoned. This application Apr. 15, 1974, Ser. No. 460,868
Int. Cl. C01f *7/56*
U.S. Cl. 423—462 **3 Claims**

1. In the process for producing basic aluminum chlorides having the general formula

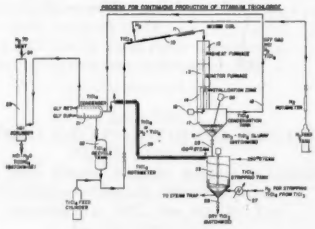
$$Al_2(OH)_{6-n}Cl_n,$$

wherein n represents a number between 1 and 5 by reacting under exclusion of air aluminum with hydrochloric acid, the improvement which comprises continuously passing the hydrochloric acid at a concentration of about 5 to 15% by weight downwardly through an elongated fixed bed of aluminum of a packing density of about 0.3 to 0.8 kg/liter, adding aluminum to the top of said fixed bed at approximately the same rate it is consumed, heating the fixed bed externally progressively to an increasing extent downwardly to maintain the temperature at about 70° to 95°C so as to promote continued reaction, the hydrochloric acid being added at such rate as to establish a contact time of about 2 to 8 hours with the aluminum bed, the concentration of hydrochloric acid, its rate of addition and the extent of external heating being controlled to impart to the resulting solution of end product a pH of about 3 to 4, and withdrawing from the bottom of the bed a solution of the basic aluminum chloride of substantially constant composition.

3,891,746
PROCESS FOR PREPARING ALPHA-TRICHLORIDE PARTICLES

Royce D. Laffitte, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 30, 1973, Ser. No. 383,637
Int. Cl. C01g *23/02*
U.S. Cl. 423—492 **8 Claims**



1. A process for producing alpha-titanium trichloride particles wherein at least a majority of said particles have an average particle size greater than 20 microns which comprises passing a mixture of hydrogen and titanium tetrachloride at a mole ratio of 0.5 to 1 to 10 to 1 through a reaction zone at a temperature within the range of about 800°C. to about 1200°C. and thereafter passing the reactor effluent into a crystallization zone in the absence of any quenching medium, the ratio of hydrogen to titanium tetrachloride in the reactants and the reaction temperature being regulated such that said reactor effluent entering said crystallization zone contains at

least about 1.75 mole percent titanium trichloride vapor, the temperature in said crystallization zone being within the range of above the dew point of titanium tetrachloride and below the sublimation temperature of titanium trichloride and regulated such that predominately heterogeneous nucleation of titanium trichloride occurs, and thereafter recovering the crystallized titanium trichloride having an average particle size greater than 20 microns and up to 100 microns.

3,891,747

CHLORATE REMOVAL FROM ALKALI METAL CHLORIDE SOLUTIONS

Glenn E. Galecki, La Grange, Ill., and Sonia R. Oberson, West Haven, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 11, 1973, Ser. No. 405,376
Int. Cl. C01d *3/14*

U.S. Cl. 423—499 **10 Claims**

1. A process for reducing the chlorate impurities in an aqueous solution of an alkali metal chloride which comprises admixing said aqueous solution with a chlorate reducing proportion of an alkali metal hydrosulfite to form an aqueous solution of an alkali metal chloride containing an alkali metal sulfate, wherein said chlorate reducing proportion is a weight ratio of said alkali metal hydrosulfite to said chlorate of from about 0.5:1 to about 10:1.

3,891,748

CONTINUOUS PROCESS FOR PRODUCTION OF HYDROGEN PEROXIDE

Rudolph Rosenthal, Broomall, and Joseph A. Kieras, Lincoln University, both of Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed June 18, 1973, Ser. No. 370,902
Int. Cl. C01b *15/02*

U.S. Cl. 423—587 **7 Claims**

1. In a process for the production of hydrogen peroxide by the acid catalyzed hydrolysis of tertiary butyl hydroperoxide, the improvement which comprises continuously contacting said tertiary butyl hydroperoxide with water in the presence of an acid in a contacting zone maintained at a temperature in the range of from 85°C. to 110°C. while separately and continuously removing as overhead from said contacting zone the tertiary butyl alcohol formed during said hydrolysis reaction and recovering the hydrogen peroxide product as bottoms.

3,891,749

DIGESTIVE PHARMACEUTICAL COMPOSITION COMPRISING S-CARBOXYMETHYL CYSTEINE FOR REDUCING VISCOSITY OF RESPIRATORY TRACT SECRETIONS, AND METHOD OF TREATING THEREWITH

Maurice L. Joullie, Saint-Germain-en-Lave, France; Gabriel Maillard, Paris, France; Lucien Lakah, Paris, France, and Pierre Muller, Paris, France, assignors to Recherche Pharmaceutiques et Scientifiques, Paris, France

Continuation of Ser. No. 010,999, Feb. 12, 1970, abandoned. This application Aug. 17, 1973, Ser. No. 389,325
Claims priority, application France, Oct. 7, 1969, 69.34139
Int. Cl. A61k *27/00*

U.S. Cl. 424—311 **14 Claims**

12. A method of reducing the viscosity of secretions of the respiratory tract, which comprises

administering to a patient an effective amount of S-carboxymethyl cysteine, by the digestive route, said effective amount being a dialy dosage of at least 1.5 grams.

3,891,750

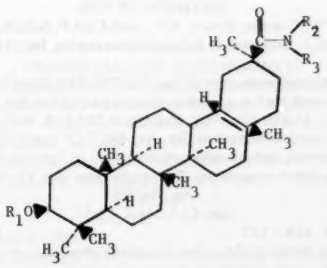
11-DEOXOGLYCYRRHETINIC ACID AMIDES USEFUL AS ANTIULCER AGENTS

Hans-Jurgen E. Hess, Old Lyme, and Roger P. Nelson, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 195,495, Nov. 3, 1971, Pat. No. 3,814,766. This application Dec. 20, 1973, Ser. No. 426,856
Int. Cl. A61k *27/00*

U.S. Cl. 424—80 **6 Claims**

1. A method for the control of peptic ulcers in animals which comprises administering intraperitoneally or orally to said animals an effective antipeptic ulcer amount of a composition containing a diluent amount of a pharmaceutically-acceptable carrier and, as the essential active ingredient, an effective amount of a compound having the formula



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wherein R_1 is selected from the group consisting of hydrogen, alkanoyl having from two to six carbon atoms and ω-carboxyalkanoyl having a total of from four to five carbon atoms; R_2 and R_3 together with the nitrogen atom to which they are attached are selected from the group consisting of piperazino, N-alkylpiperazino having from one to four carbon atoms in the alkyl moiety, N-ω-(hydroxyalkyl) piperazino having from two to four carbon atoms in the alkyl moiety and N-(carbalkoxy)piperazino having from one to four carbon atoms in the alkoxy moiety;

the pharmaceutically-acceptable alkali metal salts of those compounds having at least one carboxy group; or

the pharmaceutically-acceptable acid addition salts of those compounds having a basic group.

3,891,751

VACCINES AND PROCESSES FOR THEIR PREPARATION

Charles Pilet, Alfortville, and Marc Bonneau, Tassin, both of France, assignors to Institut Merieux, Lyon, France

Continuation of Ser. No. 827,930, May 26, 1969, abandoned. This application Sept. 30, 1971, Ser. No. 185,345

Claims priority, application Luxembourg, May 28, 1968, 56161

Int. Cl. C12k *5/00*

U.S. Cl. 424—87 **1 Claim**

1. A non-agglutinogenic non-pathogenic vaccine effective for use in the immunization against brucellosis comprising an immunizing amount of a non-pathogenic antigen corresponding to brucellosis, said antigen being inactivated whole Brucella bacteria, said antigen having essentially all its agglutinogenic sites saturated with an immune serum containing antibodies corresponding to said antigen, said serum being present in amounts essentially just sufficient to saturate said sites.

3,891,752

POLYENIC MACROLIDE COMPOSITIONS AND METHODS OF USE

Harry W. Gordon, Bronx, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Schmid Laboratories, Inc., Little Falls, N.J.

Continuation-in-part of Ser. No. 796,919, Feb. 5, 1969, abandoned, each is a continuation-in-part of Ser. No. 623,847, March 17, 1967, Pat. No. 3,584,118, and a continuation-in-part of Ser. No. 544,712, April 25, 1966, abandoned, and a continuation-in-part of Ser. No. 838,706, July 2, 1969, abandoned. This application Oct. 13, 1970, Ser. No. 80,509

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—117 **18 Claims**

17. A method of treating intestinal moniliasis in a mammal afflicted with intestinal moniliasis which comprises orally administering to said mammal an effective dose for treating intestinal moniliasis of a composition in solid form comprising (1) about 25 to about 200 mg of candicidin, and (2) in inorganic salt or base material selected from the group consisting of calcium carbonate, aluminum hydroxide, magnesium hydroxide, magnesium trisilicate, magnesium carbonate, and magnesium oxide, said composition having a pH between about 6 and about 8.5.

3,891,753

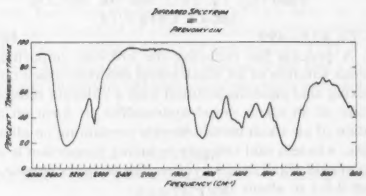
ANTIBIOTIC PRENOMYCIN AND PROCESS OF PRODUCING THE SAME

Justo Martinez Mata, Madrid, Spain, and Edward O. Stapley, Metuchen, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 7, 1974, Ser. No. 440,423

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **4 Claims**



1. An antibiotic, Prenomycin, or its pharmacologically acceptable salts thereof effective as a growth promoting agent and in inhibiting the growth of gram-positive and gram-negative microorganisms which sodium salt has an ultraviolet adsorption peak at 246 mμ in a 0.1N hydrochloric acid solution and an ultraviolet adsorption peak at 258 mμ in a 0.1N sodium hydroxide solution having an infrared spectrum in potassium bromide as shown in FIG. 1, and an elemental analysis of its free acid as follows: C = 48.5 percent; H = 7.00 percent; N = 4.9 percent; phosphorus = 1.7 percent; and O = 37.9 percent (by difference) with the said free acid having an approximate empirical for formula of: $C_{72}H_{123}N_6O_{42}P$ with a molecular weight of 1778, a measured equivalent weight of 613 and a pH one-half of 4.6.

3,891,754

ANTIBIOTIC ENSANCHOMYCIN AND PROCESS OF PRODUCING THE SAME

Edward O. Stapley, Metuchen, N.J., and Justo Martinez Mata, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 12, 1973, Ser. No. 415,185

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **7 Claims**

1. An antibiotic, Ensanchomycin, or its pharmacologically acceptable salts thereof effective in inhibiting the growth of

both gram-positive and gram-negative microorganisms which has an ultraviolet adsorption peak at 247 mμ in an acid solution and an ultraviolet adsorption peak at 258 mμ in a basic solution having an infrared spectrum in a Nujol mull as shown in FIG. 1, and an elemental analysis of its ammonium salt as follows: C = 47.11 percent; H = 6.90 percent; N = 7.67 percent; phosphorus = 1.93 percent; and O = 36.39 percent (by difference) with the said ammonium salt having an approximate empirical formula of: $C_{63}H_{110}N_9O_{36}P$ and a measured equivalent weight of 1477, and a pK_a of 4.6.

3,891,755

DOSAGE FORMULATION FOR ERYTHROMYCIN CETYL SULFATE

Shashi Pal Mehta, Waukegan, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Continuation-in-part of Ser. No. 378,297, July 11, 1973, abandoned. This application May 20, 1974, Ser. No. 471,391

Int. Cl. A61j *3/10;* A61k *21/00*

U.S. Cl. 424—157 10 Claims

1. The process of preparing pharmaceutical tablets producing high blood levels of erythromycin, comprising uniformly blending 4 parts of an aliphatic carboxylic or sulfate salt of erythromycin with 0.5 – 6 parts of magnesium hydroxide, uniformly blending said mixture with 0.25 – 6 parts of a binder, granulating this mixture in known fashion, drying the granules, uniformly blending the granules with minor optional portions of a lubricant and other commonly used excipients and compressing this mixture into tablets.

3,891,756

AGRICULTURAL PESTICIDE COMPOSITION

Hiroshi Kasugai, Tokyo; Shozo Motojima, Kawasaki, and Kazuhiko Inoue, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,619

Claims priority, application Japan, May 21, 1973, 48-56603

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—177 13 Claims

1. An agricultural pesticide composition which comprises:

at least one biopolymer having prevention effects on plant diseases selected from the group consisting of alginic acid, carrageenan, casein, β-globulin, α-globulin, lact-globulin, albumin, gluten, pectin, starch, gelatin and water-soluble salts thereof;

at least one carbonate selected from the group consisting of calcium carbonate, sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate and ammonium carbonate;

at least one organic acid selected from the group consisting of tartaric acid, citric acid, succinic acid, fumaric acid, lactic acid, malic acid, maleic acid, phthalic acid, acetic acid and lauric acid; and

1–10 percent, based on the weight of the bipolymer, of silica or a silica-containing material;

the carbonate and organic acid being present in a combined amount of 10 to 50 percent by weight based on the biopolymer.

3,891,757

ANAESTHETIC TOPICAL AND PERCUTANEOUS ADMINISTRATION WITH SELECTED PROMOTERS

Takeru Higuchi, Lawrence, Kans., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 197,919, Nov. 11, 1971, Pat. No. 3,787,571. This application Oct. 12, 1973, Ser. No. 406,011

Int. Cl. A61k *27/12*

U.S. Cl. 424—310 4 Claims

1. In a method for producing local, topical anesthesia, the improvement consisting of the step of administering cutaneously a pharmaceutical composition consisting of a first ingredient selected from the group of topical absorption promoters consisting of trichloroethanol, trifluoroethanol and mixtures thereof, a second ingredient consisting of about 0.01 to 30 percent by weight of a topical, local anesthetic drug, and wherein the first ingredient is an absorption promoter for increasing the retention and percutaneous absorption of an effective amount of the second ingredient during topical administration thereof.

3,891,758

FUNGICIAL AND ANTHELMINTIC 1-PHOSPHORYLATED BENZIMIDAZOLES

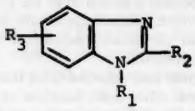
John Hannah, Matawan; Edward F. Rogers, Middletown, and Donald W. Graham, Mountainside, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 226,976, Feb. 16, 1972, Pat. No. 3,806,514. This application Dec. 27, 1972, Ser. No. 318,803

Int. Cl. A01n *9/36*

U.S. Cl. 424—200 3 Claims

1. An antifungal composition comprising an inert carrier and a fungicidal quantity of a compound having the formula:



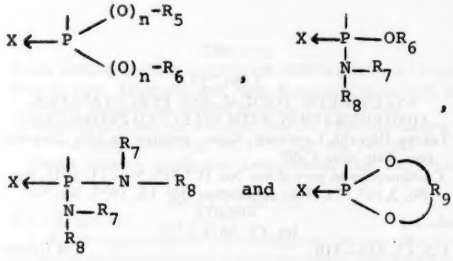
wherein

R_2 is a member selected from the group consisting of phenyl, naphthyl, orthofluorophenyl, thienyl, furyl, pyridyl, thiazolyl, isothiazolyl, pyrazinyl, 1-pyrazolyl, oxazolyl and thiadiazolyl;

R_3 is in the 5(6) position of the molecule, and is a member selected from the group consisting of hydrogen and

R_4 is a member selected from the group consisting of lower-alkoxy, phenyl, and parafluorophenyl;

R_1 is a member selected from the group consisting of:



n is 0 or 1;

R_5 is a member selected from the group consisting of alkyl, phenyl and naphthyl;

R_6 is a member selected from the group consisting of alkyl of from 2 to 10 carbon atoms, phenyl, naphthyl, an alkali metal, ammonium and loweralkyl ammonium;

R_7 and R_8 are members selected from the group consisting of hydrogen and loweralkyl, provided that at least one of R_7 and R_8 is loweralkyl;

R_9 is a loweralkylene radical of from 2 to 4 carbon atoms; and

X is a member selected from the group consisting of oxygen and sulfur, provided that when X is sulfur, R_3 is hydrogen.

3,891,759

STABILIZED SLOW RELEASE DDVP COMPOSITION

Robert Aries, 69 Rue de la Faisanderie, Paris, 16e France

Continuation of Ser. No. 45,600, June 11, 1970, abandoned. This application July 27, 1973, Ser. No. 383,095

Int. Cl. A01n *9/36*

U.S. Cl. 424—219 **1 Claim**

1. An insecticidal composition useful against houseflies, said composition consisting of

dimethyl dichlorovinyl phosphate	45%
isobutyl benzoate	20%
dibutyl maleate	10%
ethyl maleate	10%
dibutyl fumarate	5%
isoamyl isobutyrate	5%
epoxidized soybean oil	3%
tribasic aluminum stearate	2%.

3,891,760

NEMATICIDAL COMPOSITIONS COMPRISING 2-CHLORO-6-METHOXY-4-(TRICHLOROMETHYL)-PYRIDINE AND 2,2-DIMETHYL-2,3-DIHYDROBENZOFURANYL-7-N-METHYL CARBAMATE

Frances C. O'Melia, Pleasant Hill, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1974, Ser. No. 454,204

Int. Cl. A01n *9/20, 9/22*

U.S. Cl. 424—263 **6 Claims**

1. A synergistic nematicidal composition for use in soil which comprises an inert carrier and a mixture of toxicants consisting of about 1 part by weight of 2-chloro-6-methoxy-4-(trichloromethyl)pyridine and from about 1/32 to about 16 parts by weight of 2,2-dimethyl-2,3-dihydrobenzofuranyl-7-N-methyl carbamate, said mixture being present in an amount of from about 0.00001 to 90 percent by weight of the total composition.

3,891,761

N-METHYL-D-GLUCAMINE SALT OF 2(2-METHYL-3'-TRIFLUORO-METHYLANILINO) NICOTINIC ACID IN THE TREATMENT OF PAIN

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 345,608, March 28, 1973, Pat. No. 3,839,344. This application Apr. 8, 1974, Ser. No. 458,920

Int. Cl. A61k *27/00*

U.S. Cl. 424—266 **1 Claim**

1. The method for eliciting an analgesic effect in a mammal suffering from pain which comprises parenterally administering to a mammal a therapeutically effective quantity of 2(2'-methyl-3'-trifluoromethylanilino)nicotinic acid in the form of its N-methyl-D-glucamine salt.

3,891,762

METHOD FOR COMBATTING BACTERIAL PLANT DISEASES USING 2-AMINO-1,3,4-THIADIOZOLES

Osamu Wakae; Kunito Yakushiji, both of Kyoto, and Yoshiyuki Okada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Continuation-in-part of Ser. No. 191,101, Oct. 21, 1971, which is a continuation of Ser. No. 824,251, May 13, 1969, abandoned. This application Jan. 8, 1974, Ser. No. 431,601

Claims priority, application Japan, May 13, 1968, 43-32098; Sept. 2, 1968, 43-62866; Apr. 14, 1969, 44-28826

Int. Cl. A01n *9/12, 9/20*

U.S. Cl. 424—270 **8 Claims**

1. A method for combatting bacterial plant diseases caused by bacteria of the genus Xanthomonas or of the species *Pseudomonas solanacearum*, which comprises applying to said bacteria a bactericidally effective but non-phytotoxic amount of 2-amino-1,3,4-thiadiazole.

3,891,763
SYNTHETIC PENICILLINS

Shiro Morimoto, Kobe; Hiroaki Nomura, Osaka; Takeshi Fugono, Kawanishi; Kihachiro Maeda, Itami, and Toshihiro Ishiguro, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

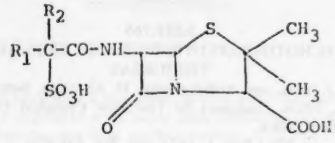
Division of Ser. No. 218,689, Jan. 18, 1972, which is a division of Ser. No. 862,018, Sept. 29, 1969, Pat. No. 3,660,379. This application Dec. 7, 1973, Ser. No. 422,779

Claims priority, application Japan, Sept. 28, 1968, 43-70572

Int. Cl. A61k *27/00*

U.S. Cl. 424—271 12 Claims

1. A method for combatting bacterial infections which comprises administering to a patient infected with the bacteria an antibacterially effective amount of a compound of the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl having 1–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, aralkyl having 7–10 carbon atoms and substituted and unsubstituted phenyl, pyridyl, naphthyl or thienyl, the substituent being one or more members selected from the group consisting of nitro, sulfo, carboxyl, halo, lower alkyl, lower alkoxy and cyclololoweralkyl, or R_1 and R_2 together represent polymethylene having 4–6 carbon atoms, or a pharmaceutically acceptable salt thereof.

3,891,764
METHOD OF INHIBITING HISTAMINE ACTIVITY WITH AMIDINE DERIVATIVES

James Whyte Black, Hemel Hempstead, and Graham John Durant, Welwyn Garden City, both of England, assignors to SmithKline & French Laboratories Ltd., Welwyn Garden City, England

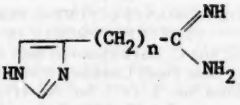
Continuation of Ser. No. 306,948, Nov. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 80,792, Oct. 14, 1970, abandoned. This application May 28, 1974, Ser. No. 473,547

Claims priority, application United Kingdom, Oct. 29, 1969, 52892/69

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 5 Claims

1. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering internally to an animal requiring inhibition of said H-2 histamine receptors in an amount sufficient to inhibit said H-2 histamine receptors a compound of the formula:



where *n* is 3 or 4 or a pharmaceutically acceptable acid addition salt thereof.

3,891,765
ANTI-INFLAMMATORY AND ANALGESIC L-HYDROXYPROLINE DERIVATIVES

Paul Coirre; Bertrand Coirre, both of Ville d'Avray; Jean-Claude Denis; Jerome Rambaud, and Jean Cahn, Paris, all of France, assignors to Franco Chimie S.a.r.l., Paris, France

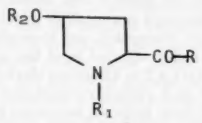
Continuation-in-part of Ser. No. 81,499, Oct. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 756,410, Aug. 20, 1968, abandoned. This application Apr. 12, 1972, Ser. No. 243,397

Claims priority, application France, Sept. 14, 1967, 67.121020; May 16, 1968, 68.152048

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 4 Claims

1. A pharmaceutical composition suitable for anti-inflammatory and analgesic use in dosage unit form comprising from 100 milligrams to 200 milligrams of a compound having the formula:



in which R is selected from the group consisting of OH, m-trifluoromethylanilido and p-trifluoromethylanilido; R_1 is selected from the group consisting of acetyl, p-isobutylphenylacetyl and 2,4-dinitrophenyl; R_2 is hydrogen or p-isobutylphenylacetyl with the proviso that when R_1 is acetyl and R_2 is hydrogen, then R cannot be OH; and a pharmaceutical carrier.

3,891,766
METHODS OF USING SUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

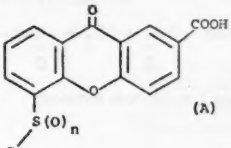
Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 174,261, Aug. 23, 1971, Pat. No. 3,801,598. This application Nov. 8, 1973, Ser. No. 413,979

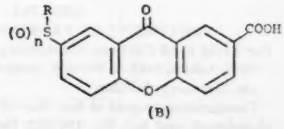
Int. Cl. A61k *27/00*

U.S. Cl. 424—283 12 Claims

1. A method for inhibiting the symptoms of the asthmatic condition resulting from an antigen-antibody reaction in a host susceptible to said reaction which comprises administering to said host an effective amount of from about 0.005 to about 100 mg. per kg. of body weight per day sufficient to produce said inhibition of a compound selected from those represented by the formulas:



(A)



(B)

or a pharmaceutically acceptable, non-toxic lower alkyl ester unsubstituted, monolower alkyl, or dilower alkyl substituted amide or salt thereof; wherein *n* is the integer 1 or 2; R is lower alkyl when *n* is 1; R is lower alkyl, hydroxy, amino, monoloweralkylamino or diloweralkylamino when *n* is 2; and wherein said lower alkyl group contains 1 to 5 carbon atoms.

3,891,767
CERTAIN TRIARYL TIN COMPOUNDS AS CHEMOSTERILANTS

Eugene E. Kenaga, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 422,554, Dec. 31, 1964, Pat. No. 3,577,548, which is a continuation-in-part of Ser. No. 244,917, Dec. 17, 1962, abandoned. This application Jan. 2, 1970, Ser. No. 5,400The portion of the term of this patent subsequent to May 4, 1988, has been disclaimed.

Int. Cl. A61k *27/00*

U.S. Cl. 424—288 **21 Claims**

1. A method useful in controlling population growth which comprises administering to an animal which reproduces gamically a minimal sterilant amount of a triaryltin compound selected from the group consisting of

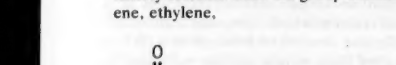
$$R_3Sn\text{-}Z \text{ and}$$

$$(R_3Sn_n\text{—}\ Y$$

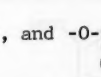
wherein, in all of its occurrences in any given triaryltin compound, R represents the same member selected from the group consisting of phenyl, and mono-substituted phenyl wherein the substituent is a member selected from the group consisting of halo, loweralkyl, and loweralkoxy; Z represents a monovalent moiety selected from the group consisting of (phenylloweralkyl), a 2 to 12 carbon alkenyl, a 4 to 12 carbon alkadienyl, a 5 to 6 carbon cycloalkenyl, a 5 to 6 carbon cycloalkadienyl, halo, hydroxy, mercapto, hydrogen, a 2 to 18 carbon alkanoate, a 3 to 18 carbon alkenoate, loweralkoxy, loweralkylthio, diloweralkylcarbamate, diloweralkylthiocarbamate, diloweralkyldithiocarbamate, radical of the formula (loweralkyl

radical of the formula (phenyl

and radical of the formula -Sn-R_3; Y represents a divalent moiety selected from the group consisting of -O-, -S-, methylene, ethylene,



4-xylene, and



wherein g is an integer of from 1 to 10, both inclusive.

3,891,768
TREATMENT OF PARKINSON'S DISEASE

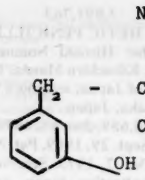
Per Arvid Emil Carlsson, Grotenborg, and Hans Rudolf Corrodi, Askim, both of Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

Continuation-in-part of Ser. No. 387,370, Aug. 10, 1973, abandoned, and Ser. No. 190,682, Oct. 19, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 390,126

Int. Cl. A61k *27/00*

U.S. Cl. 424—309 **29 Claims**

1. A method for mitigating symptoms of Parkinson's disease, comprising administering to a subject having the symptoms thereof, a therapeutically active amount of a compound of the formula



I

in which R denotes a lower, straight or branched alkyl group having one to three carbon atoms either as a racemate or as an optically active L-form as such or in the form of a salt of a pharmaceutically acceptable acid.

3,891,769
PSYCHOTHERAPEUTIC METHODS EMPLOYING THIOUREAS

Philip J. Shea, and Abdulmuniem H. Abdallah, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

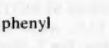
Filed Feb. 1, 1974, Ser. No. 438,926

Int. Cl. A61u *27/00*

U.S. Cl. 424—322 **42 Claims**

1. A method of treating depression which comprises:

administering to a depressed mammal an effective amount of a compound of the formula:



wherein aryl represents 2,4-dimethylphenyl, 2,4-dimethylbenzyl, 4-methoxy-2-methylphenyl, 2,4-dimethoxyphenyl, 2-methylphenyl, 3,5-dimethylphenyl, 2,5-dimethylphenyl, 2,6-dimethylphenyl or 2,4,6-trimethylphenyl.

3,891,770
PROCESS FOR RECOVERING FATS, OILS AND PROTEINS FROM WASTE LIQUOR

Takaaki Sato, Soka, and Kengo Ishida, Zama, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed July 23, 1973, Ser. No. 381,402

Claims priority, application Japan, July 26, 1972, 47-74151

Int. Cl. A23j *1/06, 3/00*

U.S. Cl. 426—32 **9 Claims**

1. A process for the treatment of waste liquor resulting from processing marine products and livestock which comprises:

adding polyacrylate to said waste liquor;

subjecting said waste liquor to microfine aeration to develop a froth;

denaturing said froth by adjusting the pH thereof to about 8.0 to 11.0;

subjecting said froth to enzymatic decomposition by adding a protease enzyme thereto; and

thereafter separating and recovering the fats and oils from said froth.

3,891,771
METHOD OF MANUFACTURING FERMENTED VEGETABLE PRODUCTS

Dan E. Green, and L. Mark Hanover, both of Rockford, Ill., assignors to Dean Foods Company, Rockford, Ill.

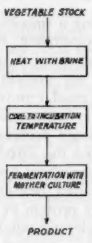
Filed Nov. 1, 1973, Ser. No. 411,685

Int. Cl. A23b *7/10*

U.S. Cl. 426—52 **24 Claims**

1. A method for the production of fermented vegetables comprising the steps of contacting a finely divided vegetable

with hot water to heat the vegetable to its pasteurization temperature and to leach fermentable carbohydrates therefrom and thereby form an aqueous extract; cooling the vegetable and the aqueous extract to a temperature for incubation of lactic acid producing bacteria; inoculating the vegetable in contact with the aqueous extract with a mother culture produced by blanching a vegetable, subsequently inoculating the blanched vegetable with lactic acid producing bacteria and incubating the resulting mother culture until the titratable acidity as lactic acid of the mother culture is up to 0.5 percent by weight; and incubating the vegetable in contact with the aqueous extract in the presence of the mother culture until fermentation is complete.



3,891,772

EXTRACTION OF UNDESIRABLE FLAVOR AND ODOR COMPONENTS FROM MICROBIAL CELLS

John A. Ridgway, Jr., La Porte, Ind., and Kwei C. Chao, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 442,247, Feb. 13, 1974, which is a continuation-in-part of Ser. No. 285,848, Sept. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 64,866, July 24, 1970, abandoned. This application May 3, 1974, Ser. No. 466,673

Int. Cl. A23j *1/18*; **C12c** *11/28, 11/30*

U.S. Cl. 426—60 **23 Claims**

1. A process for improving the flavor characteristics of single-cell microbial organisms, comprising the steps of:

a. drying said single-cell microbial organisms to a moisture content no greater than about 8 wt. percent;

b. preparing a slurry of the dried single-cell microbial organisms with an aqueous alcoholic solution containing 60 to 80 vol. percent of an aliphatic alcohol having 1 to 3 carbon atoms per molecule in an amount to provide a weight ratio of alcoholic solution to single-cell microbial organisms within the range from 3:1 to 7:1, whereby the viable cells are killed when mixed with said alcoholic solution;

c. agitating the slurry at a temperature in the range from 20° to 100°C. for a period of 0.1 to 2.0 hours;

d. filtering the slurry to recover extracted single-cell microbial organisms; and

e. drying the extracted single-cell microbial organisms to yield a substantially solvent-free product.

3,891,773

CULTURE OF SOUR DOUGH BACTERIA

Leo Kline, Richmond, and Takashi F. Sugihara, Pinole, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 26, 1971, Ser. No. 119,381

Int. Cl. C12k *3/00*; **A21d** *8/00, 8/04*

U.S. Cl. 426—61 **5 Claims**

1. The process for preparing a product useful in the production of sour dough bakery products which comprises:

a. providing a liquid nutrient medium containing water, maltose, an unsaturated fatty acid derivative, and fresh yeast extractives, and having a pH of 6 or below,

b. inoculating the nutrient medium with viable cells of the sour dough bacteria, *Lactobacillus sanfrancisco, and*

c. holding the inoculated nutrient medium at a temperature of about 25°–35°C. until a substantial growth of the bacteria has taken place.

3,891,774

SOFT TEXTURED DRY PROTEIN PRODUCT AND METHOD FOR FORMING SAME

Richard J. Baker, St. Louis; Timothy A. Miller, Ferguson; Gary K. Erlinger, St. Charles; Stephanus F. Loepiktie, St. Louis, and Larry R. Hanselman, Affton, all of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 38,601, May 18, 1970, abandoned. This application Oct. 17, 1973, Ser. No. 407,370

Int. Cl. A23j *3/00*

U.S. Cl. 426—104 **34 Claims**

1. A method of treating a protein-containing vegetable material to form a soft dry textured expanded food product comprising the steps of: providing a protein source material of the group consisting of oilseed meals, animal, fish and poultry by-product meals, and microbial protein having an equilibrium moisture content and a protein content between about 30 and 75% by weight; mixing an organic plasticizing solvent which is selected from the group consisting of glycerol, propylene glycol and mixtures thereof at a level of between about 10 and 50% by weight of the mixture and thereafter said mixture is heated to an elevated temperature above 212° F. and while applying elevated pressures for a time period sufficient to convert said mixture into a flowable substance; then forcing the heated, pressurized, plasticized, mechanically worked material through first restricted orifice means, maintaining the material under elevated temperatures and pressures as it emerges from said first restricted orifice means; and then extruding the material through second restricted orifice means into an environment of a pressure substantially lower than said elevated pressures causing expansion of the product with evaporation of at least part of the moisture and the formation of the expanded soft dry food product having a residual water content of between about 3–7% by weight as it emerges from the extruder.

3,891,775

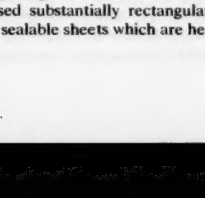
VENTABLE TOASTER PACKAGE

Edward J. Murray, 6104 California St., Apt. 1, San Francisco, Calif. 94121, and Andrew C. Piggot, 289 Miramontes Rd., Woodside, Calif. 94062

Filed Oct. 23, 1973, Ser. No. 408,622

Int. Cl. B65b *25/22*

U.S. Cl. 426—107 **4 Claims**



1. A food packet, for use as both a food storage and heating container, comprising:

a. two opposed substantially rectangular panels of laminated heat sealable sheets which are heat sealed together

at their edges to form a container having a cavity in which the foodstuffs prepared for consumption are contained,

b. the laminated sheets having an aluminum outer sheet, a mylar intermediate layer, and a polyethylene inner layer, and the aluminum outside surface having a heat absorbing coating to provide a non-tearable sheet which readily passes heat therethrough,

c. the sheets being dimensioned so that the entire food packet can be placed within the receiving slot of a heater unit,

d. the upper periphery of the container having an integral handle section formed therewith,

e. a pull type venting element of small cross section having its central portion sealed between the opposed laminated sheets along the upper heat sealed section immediately above the food containing cavity, with its lower end extending into the food containing cavity and having an upper section extending out of the food packet and of sufficient length to be grasped by the user to that the entire element can be pulled free of the packet to provide a venting passageway at the top of the packet.

3,891,776

PROTEIN PRODUCT

Roland Paul Carpenter; William Pirie Cowie, both of Aberdeen, Scotland; Alan Heyes, Oakley, England, and Anthony Hubert Sutton, Stonehaven, Scotland, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 2, 1972, Ser. No. 303,177

Int. Cl. A23j *3/00*

U.S. Cl. 426—573 **7 Claims**

1. A protein-containing food product suitable for use as an ingredient in savoury or unsweetened foodstuffs, which food product is in the form of a thermostable gel and consists essentially of:

a. about 0.3 to 3.0% by weight of a cellulose ether selected from edible water-soluble alkyl, hydroxyalkyl and carboxyalkyl celluloses the alkyl radicals of which contain from 1 to 3 carbon atoms;

b. about 0.2 to 5.0% by weight of a calcium salt of an edible alginic acid; and

c. the balance comprising water and an edible protein ingredient selected from the group consisting of finely divided or chemically concentrated fish, meat, poultry and vegetable protein.

3,891,777

METHOD OF MAKING PROTEIN FOOD PRODUCTS RESEMBLING CHEESE

Robert Allan Boyer, Creve Coeur, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 40,365, May 25, 1970, abandoned. This application Apr. 28, 1971, Ser. No. 138,304

Int. Cl. A23j *3/00*

U.S. Cl. 426—573 **18 Claims**

1. A process for producing a smooth textured food product from isolated vegetable protein comprising: forming an aqueous slurry of an isolated vegetable protein and water, homogenizing the slurry to form a uniform slurry of proteinaceous material, compressing the uniform slurry to substantially hold the proteinaceous material together and heat setting the protein to impart a smooth texture to the product.

3,891,778

METHOD OF MAKING PROTEIN FOOD PRODUCTS RESEMBLING CHEESE

Robert Allan Boyer, Creve Coeur, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 40,365, May 25, 1970, abandoned. This application Nov. 18, 1970, Ser. No. 90,839

Int. Cl. A23j *3/00*

U.S. Cl. 426—573 **10 Claims**

1. A process for forming a smooth, textured food product from soybean protein comprising: forming a dispersion of defatted soybean meal and water at an elevated pH above the iso-electric point of the soy protein thereby extracting the protein from the soybean meal, removing the suspended solids from the aqueous protein extract, adjusting the pH of the separated aqueous extracted protein dispersion to between about 8 to 11 and heating the dispersion to between about 160° to 310° F. for between about 5 seconds to 30 minutes to produce a viscous hydrated heat-treated aqueous protein solution, precipitating the protein by adjusting the pH of the solution to about the isoelectric point of the protein, separating the precipitated protein from the solution to recover a viscous, hydrated, heat-treated aqueous protein, homogenizing the viscous hydrated heat-treated aqueous protein to form a uniform slurry, compressing the uniform slurry to hold the proteinaceous material together and heat setting the protein to impart a smooth texture to the product.

3,891,779

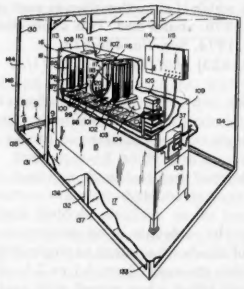
ASEPTIC PACKAGING OF FOODS

David V. Robinson, Laurel, Md., assignor to Donald A. Rosini, Shamokin, Pa., a part interest

Division of Ser. No. 53,087, July 8, 1970, abandoned. This application Nov. 8, 1971, Ser. No. 196,837

Int. Cl. A23l *3/02*

U.S. Cl. 426—399 **10 Claims**



1. A method for the production of an aseptic packaged food product which comprises disposes a filling maching having a covered filling zone in a completely walled pressure-sealed clean room, spraying the atmosphere and all surfaces of the clean room and of said filling zone with a liquid solution of a microorganism-killing agent for a time long enough to kill all microorganisms present, and maintaining said agent on said surfaces throughout the course of said method; then flowing filtered presterilized air through the clean room in a path across outer surfaces of said machine and over and past an operator adjacent thereto, thereby picking up any microorganisms from the operator and carrying the same away from the machine, removing said air through a closable opening in the room, flowing filtered presterilized air through said covered filling zone and removing the same from the product discharge end of the machine and from said room, maintaining

air pressure in said room at a slightly superatmospheric value to prevent entry of microorganisms from the atmosphere outside the clean room, maintaining air pressure in the filling zone higher than in said clean room, and continuing said air flows as long as the operator attends said machine; coincidently with said air flows, flowing said food product through a heating zone, heating the food therein at a temperature sufficiently high and for a time sufficiently long as to kill microorganisms contained therein, flowing the sterile food through a presterilized cooling zone, flowing the cooled food to said filling machine in the clean room, aseptically introducing a stack of presterilized containers and a stack of presterilized container lids to said filling zone of the machine, aseptically filling each container with sterile food and capping and sealing the same in said machine, and removing sealed containers from the machine and from the clean room through a closable exit in the latter while maintaining the air pressure therein at said superatmospheric value; said food product in the non-sterile state being perishable if not refrigerated, and said sealed containers of sterile food product being storable without refrigeration for a period of time at least twice as long as the storage period of the refrigerated non-sterile food.

3,891,780
CRUSTACEAN WASTE WATER PRODUCT RECOVERY PROCESS

Leo J. Novak, 2941 S. Dayton-Lakeview Rd., New Carlisle, Ohio 45344, and William A. Myers, III, 4950 Feliciana Dr., New Orleans, La. 70126

Filed Apr. 13, 1973, Ser. No. 350,921
Int. Cl. A23b *1/0*
U.S. Cl. 426—657 **7 Claims**

1. In the canning of crustacean seafood including shrimp which comprises peeling and aqueous washing using water jets to remove the hull or shell portions prior to canning, and the resultant production of cannery waste water, the steps comprising subjecting the resultant washings to screening to remove coarse solids and additionally filtering the washings after the screening operation to remove insolubles which would clog the jets, recycling the filtered washings through the peeling operation for at least two times, acidifying the resultant washings to bring about precipitation of the water soluble protein components, settling the precipitated protein to recover a supernatant liquid, thereafter filtering the supernatant liquid on a precoat vacuum filter, and then subjecting the resultant filtrate to reverse osmosis to recover a protein concentrate and substantially pure water.

3,891,781
PROCESS FOR THE EXTRACTION OF HOPS

Kurt Bauer; Helmut Findeiss, and Alfred Krempel, all of Holzminden, Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Germany

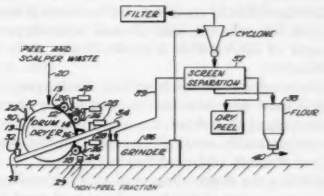
Filed Sept. 6, 1973, Ser. No. 394,899
Claims priority, application Germany, Sept. 8, 1972, 2244065
Int. Cl. C12c *9/02*
U.S. Cl. 426—429 **33 Claims**

1. Process for substantially separating the essential ingredients of hops, which process comprises subjecting a primary extract of hops in an organic solvent, containing as components (i) neutral substances, (ii) bitter substances and (iii) tannins, to a first liquid-liquid extraction with a second organic solvent different from said primary extract solvent whereby either (iii) the tannins or (i) the neutral substances are substantially separated off, leaving a residual solution of (i and ii) neutral and bitter substances or (iii and ii) tannins and bitter substances, and subjecting the residual solution to a second liquid-liquid extraction with an organic solvent different from said second organic solvent to separate said solution into its components.

3,891,782
METHOD OF EXTRACTING POTATO FLOUR FROM WASTE PEEL AND DEHYDRATOR WASTE

Max G. Wilhelm; William Truman Manning, and James D. O'Neil, all of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Oct. 12, 1973, Ser. No. 405,946
Int. Cl. A23b *7/03*
U.S. Cl. 426—455 **12 Claims**



1. A method of preparing potato flour from potato waste mash comprising a mixture of potato pulp and specks, said specks being waste made up of a peel fraction and a non-peel fraction, with a drying drum and a plurality of longitudinally extending applicator rolls spaced circumferentially thereabout with each applicator roll located a selected distance on the order of a fraction of an inch from the surface of the drying drum, said distance also being less than that which allows potato on the rolls to fall off and greater than that wherein the potato will not transfer to the dryer drum, said process comprising: heating the drying drum to a temperature between about 310°–360°F., applying the potato waste mash containing specks to the drying drum, rotating the drying drum and the applicator rolls to cause the mash to form a layer on the drying drum and to cause primarily the non-peel fraction of the specks to accumulate on each of the applicator rolls, removing the non-peel fraction of the specks from each of the applicator rolls, removing dried potato containing specks primarily in the form of said potato peel from the drying drum in sheet form, periodically ascertaining the peel contamination of the finished potato flour to determine the amount of peel therein, conditioning the sheet by maintaining or adjusting the moisture content of the potato thus removed in sheet form between about 10 to 14 percent by weight, grinding the sheet by subjecting the sheet to mechanical impact, said moisture conditioning to between 10–14 percent and said mechanical impact grinding coacting to cause the dried potato sheet to fracture on the cleavage planes at the interface between the peel waste and the pulp, the fracturing at said interface being due to the physical characteristics of the sheet resulting from said conditioning and thereafter separating the pulp from the peel waste.

3,891,783
METHOD AND APPARATUS FOR CHEESE MANUFACTURE

Peter Struan Robertson, and Raymond Bysouth, both of Palmerston North, New Zealand, assignors to New Zealand Dairy Research Institute, Palmerston North, New Zealand

Continuation of Ser. No. 271,236, July 13, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 448,025
Claims priority, application New Zealand, July 13, 1971, 164291
Int. Cl. A23c *19/02*
U.S. Cl. 426—478 **27 Claims**

1. A method of cheesemaking using a vertical curd fusion chamber with an upper admitting portion having sides which are substantially parallel and a lower tapered portion terminating at its lower end in a discharging portion so that curd is admitted to said upper portion and is discharged from said lower portion, said curd fusion chamber in said tapered portion having a horizontal cross section which diminishes gradu-

ally in area between said admitting portion and said discharging portion, said method comprising the steps of:

a. elevating adequately drained curd through pneumatic conveying apparatus to said upper admitting portion of said fusion chamber;

b. feeding the curd to said upper admitting portion through a horizontal nozzle arranged tangentially with respect to the walls of said upper admitting portion;

c. allowing the curd to remain in the fusion chamber until a desired hydrogen ion concentration is developed therein;

d. draining the curd by drains both in the external wall of said curd fusion chamber and by internal slotted vertical pipes which in use also serve to resist downward movement of the curd as it passes downwardly through the chamber;

e. discharging the curd from said discharging portion such that curd first admitted to said fusion chamber is first discharged therefrom, causing consolidation to occur in a substantially vertical direction during passage of the curd through said curd fusion chamber;

f. dividing the descending curd into a plurality of separate columns prior to discharge from said curd fusion chamber;

g. cutting the discharged columns of curd into blocks as it is discharged from said fusion chamber; and

h. delivering the discharged blocks of curd to a curd mill for further milling in a manner such that the blocks are oriented so that milled fingers of curd are formed with the length of each finger substantially parallel to the direction of curd flow.

7. Apparatus for use in making cheese, said apparatus comprising: a vertical curd fusion chamber with an upper admitting portion having sides which are substantially parallel and a lower tapered portion having a cross section which decreases gradually in area from top to bottom of said lower portion; pneumatic feeding means for elevating drained curd to said upper admitting portion; said feeding means terminating at said admitting portion in a horizontal nozzle arranged tangentially with respect to said admitting portion so that the curd is deposited in the vicinity of the walls of the chamber on top of curd already in said curd fusion chamber; said curd fusion chamber having dimensions such that curd may be held therein for a period of time sufficient to permit a required hydrogen ion concentration to be obtained after a suitable period of time of holding; an external draining system including members defining apertures in the walls of said curd fusion chamber leading to passageways outside the curd fusion chamber; an internal draining system including a plurality of slotted vertical pipes disposed internally within the curd fusion chamber so as to be surrounded by curd in use; delivery means in the bottom of said lower portion for delivering curd from said curd fusion chamber in a manner such that curd first fed to the curd fusion chamber is first discharged therefrom, said delivery means including a plurality of delivery tubes which separate the descending curd into a plurality of separate columns; means for cutting the discharged columns of curd into blocks as it is discharged from said fusion chamber; and means for delivering the discharged blocks of curd to a curd mill for further milling, such that the blocks are oriented so that milled fingers of curd are formed with the length of each finger substantially parallel to the direction of curd flow.

3,891,784

METHOD OF PREPARING OXIDATION RESISTANT BRAZED JOINTS

Gordon E. Allardyce, Dearborn Heights; Roy Amedee, and Claude Belleau, both of Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 316,145, Dec. 18, 1972, Pat. No. 3,797,087. This application Nov. 1, 1973, Ser. No. 411,965

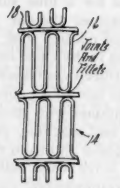
Int. Cl. C23c *9/00*

U.S. Cl. 427—295 **5 Claims**

1. A method of preparing oxidation resistant brazed joints comprising the steps of:

providing a structure having a copper brazed joint;

coating the copper joint with aluminum and heating the structure at an elevated temperature for a time sufficient to cause diffusion of aluminum substantially throughout



the copper joint and the alloying of the aluminum therewith; the heating step being accomplished with an atmosphere selected from the group consisting of inert, reducing and vacuum atmospheres.

3,891,785

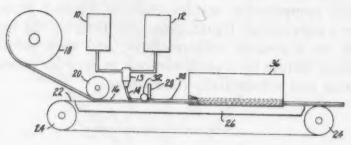
PROCESS FOR FORMING A FLEXIBLE POLYURETHANE COATING

John C. Zemlin, Reading, Mass., assignor to USM Corporation, Boston, Mass.

Filed Mar. 20, 1973, Ser. No. 343,177

Int. Cl.[2] B44D *1/14*

U.S. Cl. 427—359 **5 Claims**



1. The process for forming a flexible polyurethane coating or film including the steps of continuously introducing polyurethane-forming reagents from supply containers to a mixing zone under temperature conditions maintaining said reagents in liquid condition, mixing said reagents in said zone, continuously discharging the mixed reagents from said zone as a substantially solvent free liquid continuous stream of a mixture of said reagents, said reagents comprising a polyisocyanate, a difunctional amine in amount equivalent to from about 5 to about 35 percent of the reactive —NCO of said polyisocyanate and a diol having a molecular weight of from about 500 to about 3,000, the reactive hydrogen of said diol and amine being substantially equivalent to the reactive —NCO groups of said polyisocyanate and said mixture being reactive to form a pseudoplastic intermediate stage material having an extremely high viscosity at which it will not dive into porosities on a casting surface at shear rates approaching zero and a very much lower viscosity suitable for blending, spreading and coating under shearing agitation, depositing said stream of mixed reactants on a continuously moving surface whose path leads beneath a spreader element and then through a heated

curing zone, said spreader element extending across said surface and being disposed relative to said surface to form a layer on said surface by allowing passage between said element and said surface of a thickness of said mixture on said surface determined by the desired thickness of said coating or film and to hold back passage of mixed reactants on said surface greater than said determined thickness above said surface, reacting successive portions of said mixture of reagents to said pseudoplastic intermediate state while being moved toward said spreader element, collecting on said surface mixed material held back by said spreader element as a bank, the relative movement between said surface and said spreader element creating shearing agitation in and a rolling movement of said bank to provide said lower viscosity state in the material in said bank, continuously incorporating and blending further mixture from said surface into the mass of reactive mixture in said bank, spreading mixture from said bank on said surface by said spreader element, withdrawing portions of the blended material on said surface from the agitated mass in said bank as a layer passing beneath said spreader element while the mass remains spreadable through balance of freshly mixed against previously mixed reagents and does not set up, controlling the size of the agitated mass in said bank by correlation of the rate of supply of the mixture of reagents to said surface and the rate of withdrawal to provide dwell time of reactive mixture in said bank, the viscosity of said mixture in said layer becoming extremely high when the layer has left the spreader element and shearing agitation ceases, and then heating said layer to curing temperature during passage on said surface through said heated curing zone.

3,891,786

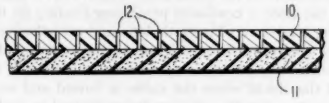
ELECTRICALLY CONDUCTIVE SHEETING

Christine Conklin, Newark, N.J., assignor to Herculite Protective Fabrics Corporation, New York, N.Y.

Filed Oct. 5, 1973, Ser. No. 403,730

Int. Cl.[2] H05F *3/00;* **B32B** *25/02, 25/08, 3/24*

U.S. Cl. 428—136 **32 Claims**



1. A flexible, electrically conductive sheeting having a surface resistivity and a volume resistivity, each below 10^6 ohms comprising:

a first solid layer of a polymeric film material which, prior to incorporation in said sheeting has a surface resistivity of at least above 10^{11} ohms,

a second layer of rubber bonded to one surface of said polymeric film material, said rubber being filled with from about 25 to about 40 by weight of the rubber of electrical grade carbon black, and

said first layer of polymeric film material having micro-perforations in a density of from about 5 to about 25 micro-perforations per square inch, the micro-perforations having a diameter of from about 0.003 to about 0.012 inch.

3,891,787

ELECTROSTATIC RECORDING MEMBER

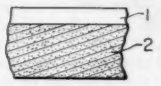
Seizi Ueyama, Osaka, Japan, assignor to General Company Ltd., Tokyo, Japan

Continuation of Ser. No. 197,756, Nov. 11, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,143

Int. Cl. B32b *5/16;* **B41m** *5/00*

U.S. Cl. 428—409 **7 Claims**

1. An electrostatic recording member which comprises an electrically low resistant substrate having a recording layer thereon which consists essentially of an inorganic pigment or a metal soap dispersed in a resin film which is composed of at least 30% by weight, based on the weight of the resin film, of a fatty acid modified epoxy resin ester having a degree of



esterification of from 30% to 90% and up to 70% by weight of a member selected from the group consisting of polyvinyl chloride and polymers of acrylic acid esters and methacrylic acid esters, wherein the surface resistivity of the recording layer is at least about 10^{12} ohm-cm.

3,891,788

ETHYLENE-VINYL CHLORIDE EMULSION COATED PLASTIC LAMINATE

William M. Karszes, Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,514

Int. Cl.[2] B32B *27/10*

U.S. Cl. 428—511 **6 Claims**

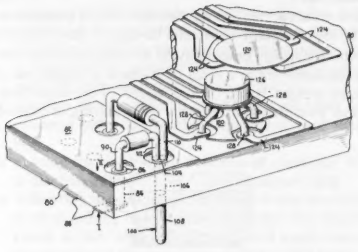
1. A plastic laminate comprising at least one resin impregnated paper sheet and wherein there is enhanced adhesion with adhesives to substrates without roughening, said laminate having at least on its adhering surface a coating comprising polymerized ethylene vinyl chloride emulsion emplaced before heat and pressure consolidation of the laminate, said ethylene vinyl chloride polymer emulsion comprising a blend of, by weight, from about 55 to 80 percent of ethylene vinyl chloride having carboxyl pendant groups and from about 45 to 20 percent of ethylene vinyl chloride polymer having amide pendant groups.

ELECTRICAL

3,891,789
WELDING METHOD AND MEANS USING FOIL ELECTRODE

Robert Charles Swengel, Sr., Hellam, and J. A. Crumley, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 55,614, July 16, 1970, which is a continuation of Ser. No. 720,777, April 12, 1968, abandoned. This application Nov. 9, 1972, Ser. No. 305,192
Int. Cl. Ho5k *1/18*
U.S. Cl. 174—68.5 **1 Claim**

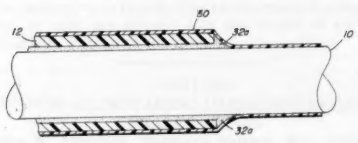


1. As an article of manufacture a connecting device including at least one insulating member, at least one conductive member carried therein with a surface portion proximate a surface portion of said insulating member, a foil-like member carried on the surface portion of said insulating member, in engagement with said surface portion of said insulating member whereby to receive a further conductive member positioned thereagainst with the foil-like member interposed between said further conductive member and said one conductive member, the said surface portion of the one conductive member having an area and configuration whereby upon the application of a current to a circuit across said one conductive member and said foil-like member, the said foil-like member will be vaporized to be isolated from said one conductive member and said further conductive member to permit direct fused contact between said one conductive member and said further conductive member.

3,891,790
SPLICING AND REPAIRING INSULATED ELECTRICAL WIRE

William L. Kierstead, Newton Centre, Mass., assignor to Electronized Chemicals Corporation, Burlington, Mass.

Filed Mar. 4, 1974, Ser. No. 447,645
Int. Cl. H02g *15/08*
U.S. Cl. 174—93 **5 Claims**

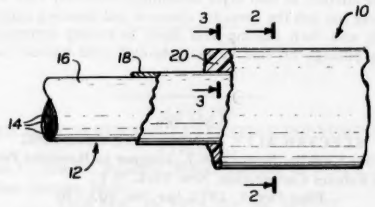


1. An improved, covered electrical wire comprising in combination:
   a. an electrical wire;
   b. an adhesive material which is workable at elevated temperatures disposed around a portion of the electrical wire;
   c. a heat-recoverable sleeve disposed around the adhesive material and the wire portion, said sleeve being shrunk around the wire portion and forcing some of the adhesive to flow out of the ends of the sleeve and forming an adhesive bead thereat; and
   d. two heat-recoverable tubes one disposed over each of the adhesive bead at each end of the sleeve, each tube extending around a segment of the sleeve and a segment of the wire which are adjacent to the bead each tube being heat shrunk forming a tight-fitting cover around the end of the sleeve and compressing and shaping the adhesive bead to enhance its adhesive contact with the wire and the edge of the sleeve.

3,891,791
COMMUNICATION CABLE WITH IMPROVED COATED SHIELD

Gertraud A. Schmidt, Long Branch, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Filed May 10, 1974, Ser. No. 469,012
Int. Cl. H01b *7/22*
U.S. Cl. 174—107 **7 Claims**



1. An electric communication cable comprising a cable core, insulation on the cable core, a shield of corrosive metal around the core, a corrosion protecting coating on the shield including a mixture of polyethylene and an adhesive copolymer, the adhesion of the mixture to the metal of the shield being sufficiently strong to prevent delamination of the coating and the shield when the cable is buried and exposed to ground water, but the adhesion being limited to such a value that the coating can be peeled from the surface of the shield when an edge of the coating is broken loose from the metal the coating containing sufficient adhesive copolymer to require a force of between 1 and 2.5 pounds to separate a one inch wide strip of the coating from the metal shield at 10 inches per minute, and the maximum ratio of polyethylene to copolymer being about 4:3.

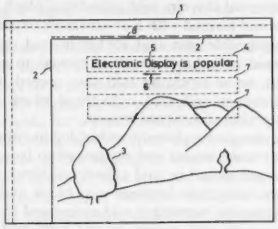
3,891,792
TELEVISION CHARACTER CRAWL DISPLAY METHOD AND APPARATUS

Hisao Kimura, Kyoto, Japan, assignor to Asahi Broadcasting Corporation, Osaka, Japan

Filed June 25, 1974, Ser. No. 482,922
Int. Cl. G08b *5/36*
U.S. Cl. 178—5.8 R **17 Claims**

1. The method of displaying characters upon a television screen in addition to displaying a television image, which includes the steps of;
   a. incrementally formulating character-forming information (8) during the interval of time not required for forming television image information,
   b. temporarily storing said character-forming information,
   c. gating-out said stored character-forming information at a time other than during said interval of time,

d. combining the gated-out character forming information with said television image information, and



e. displaying said characters and said television image for simultaneous viewing.

3,891,793

BINARY CODING DEVICE

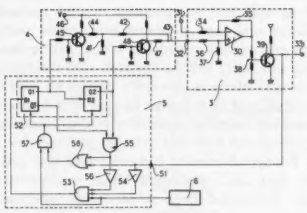
Martin De Loye, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed May 10, 1974, Ser. No. 468,980

Claims priority, application France, May 11, 1973, 73.17087

Int. Cl. H04n 1/40

U.S. Cl. 178—6 18 Claims



1. A device for the binary coding of data on a document to be reproduced with different tints comprising scanning means for scanning a document by successive elementary points to generate an analog reading voltage for each point examined, generating means for generating a variable comparison voltage, said generating means being connected with a control means, and comparison means for comparing said analog reading voltage and said variable comparison voltage, said comparison means generating a binary 0 or 1 signal from the comparison,

said control means including a binary counter connected with a control clock synchronized with the scanning element, and a logic means for connecting said clock to said binary counter,

said logic means comprising first means for controlling the evolution of the counter from a first state up to a second state, said first means receiving a first binary signal from said output binary comparison signal of said comparison means, second means for ensuring the forced setting of said binary counter to said first state, and third means for controlling said second means through an OR gate to ensure the coding of said second state of said binary counter, said second means further controlling said binary counter upon the appearance of a second binary comparison signal at the output of said comparison means by controlling the evolution of said variable comparison voltage between a first predetermined level and a second predetermined level corresponding respectively to said first and second states of said binary counter.

3,891,794

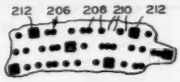
METHOD AND APPARATUS FOR SYNCHRONIZING PHOTOGRAPHIC RECORDS OF DIGITAL INFORMATION

James T. Russell, Richland, Wash., assignor to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 202,539, Nov. 26, 1971, Pat. No. 3,795,902, which is a continuation-in-part of Ser. No. 857,474, Sept. 12, 1969, Pat. No. 3,624,284, which is a division of Ser. No. 576,580, Sept. 1, 1966, Pat. No. 3,501,586. This application July 2, 1973, Ser. No. 375,336

Int. Cl. G06k 7/14

U.S. Cl. 178—6.7 R 16 Claims



1. A signal recording and playback system comprising:

input means for generating electrical pulses which form a first digital coded electrical signal,

optical recorder means including a light source connected to said input means so that the pulses of said first digital signal are transmitted in series to said light source for producing a beam of light pulses which form a digital coded light signal corresponding to said first digital signal, means for scanning said light pulses across a photographic record element to produce a photo record of said digital coded light signal in the form of a series-recorded track of a plurality of small spots representing digital bits recorded at a high density, said spots being approximately all of the same size,

optical playback means including at least one light detector and light deflection means for scanning said record element along said track of spots to transmit a light signal to the light detectors for producing electrical pulses which form a second digital coded electrical signal corresponding to the digital light signal recorded on said photographic record,

and output means connected to said light detector for transmitting substantially all of the pulses of said second digital signal,

wherein said digital signal as represented by said plurality of spots has a data configuration indicative of word groups of said spots, said output means having means for detecting the last mentioned data configuration for synchronizing the second digital electrical signal relative to word groups.

3,891,795

AUTOMATIC DAY-NIGHT TELEVISION SURVEILLANCE SYSTEM

Quentin S. Johnson, 703 W. Nettletree Rd., Sterling, Va. 22170, and Edward H. Pignone, 2537 Villanova Dr., Vienna, Va. 22180

Filed Apr. 11, 1974, Ser. No. 460,089

Int. Cl. H04n 5/38

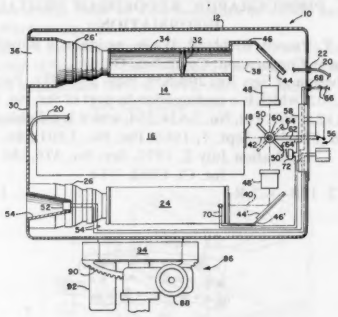
U.S. Cl. 178—7.2 10 Claims

1. A closed circuit television surveillance system for night-viewing at scene illumination levels as low as 10^{-5} ft-candles and day-viewing at scene illumination levels as high as 10^{4} ft-candles, capable of automatically switching between a night-viewing mode and a day-viewing mode, and having a single daylight television camera receiving a scene image along a viewing axis, comprising:

a night-viewing optical system including an image intensifier and a first objective lens disposed at one end of said

image intensifier for receiving and transmitting the image along a first optical axis;

a day-viewing optical system including, in optical alignment, a second objective lens and a field lens for receiving and transmitting the image along a second optical axis;



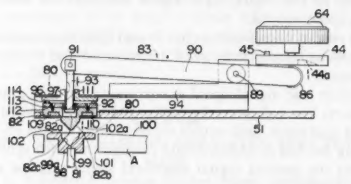
aligning means for automatically and selectively placing one or the other of said optical systems in optical alignment with the viewing axis of the daylight television camera depending upon the average scene illumination level thereby to adapt the system for day or night viewing; and means for supplying power to said image intensifier and said aligning means.

3,891,796

POSITIONING AND MOUNTING MEANS FOR A FLEXIBLE VIDEO DISK

Ichiro Takahara; Tadahiko Yabu, and Jihei Fujita, all of Osaka, Japan, assignors to Sanyo Electric Company, Ltd., Osaka, Japan

Filed Dec. 7, 1973, Ser. No. 422,865
Claims priority, application Japan, Dec. 8, 1972, 47-123551
Int. Cl. H04n *3/00*
U.S. Cl. 178—6.6 DD **3 Claims**



1. A video disc player for use with a flexible foil-type disc, said player comprising:

a stationary table;

a motor-coupled rotatable spindle positioned with respect to said table for driving said flexible foil-type disc record about its center at a predetermined high speed while it hovers on a rotation-induced air cushion above the stationary table during the rotation thereof;

a record mount rigidly mounted on said rotatable spindle for supporting the disc record thereon in alignment with a central portion of the disc record while the remaining portion of the disc record rests on the stationary table when said record mount is not rotated, said record mount having a top surface positioned above the plane of said stationary table, said top surface having a peripheral portion radially downwardly inclined such that the inclined peripheral portion thereof is substantially contiguous with the plane of said stationary table, said record mount further having an inwardly recessed socket formed therein in alignment with the longitudinal axis of the rotatable spindle;

a cylindrical block for movement between engaged and disengaged positions and having an axially extending cavity formed therein, said cylindrical block further having one end formed with a downwardly extending projection engageable into said socket in said record mount, when said cylindrical block is moved to said engaged position, so as to clamp said disc record between said record mount and said cylindrical block for rotation together with said record mount;

an annular magnetic element embedded in either said block or said record mount and positioned to face the other of said record mount or said cylindrical block for effecting magnetic attraction between said block and said record mount thereby permitting said cylindrical block to rotate together with said record mount with said disc record sandwiched therebetween;

control means including an operating rod for movement between first and second positions such that when said operating rod is in said first position, said cylindrical block is in said disengaged position and when said operating rod is in said second position, said cylindrical block is in said engaged position, said operating rod having a land of a diameter greater than the diameter of said rod integrally formed on one end thereof, said cylindrical block having the other end formed with an opening, said opening having a diameter smaller than that of said land and through which a portion adjacent said one end of said rod loosely extends with said land situated inside said cavity, wherein when said rod is in said second position said land is suspended in the space within said cavity clear of the inside surface of said other end of said cylindrical block, and as said rod is upwardly moved towards said first position said land contacts said inside surface of said other end of said cylindrical block, said cylindrical block being upwardly shifted towards said disengaged position when said block is upwardly moved by said land of said operating rod as it moves to said first position; and

a smoothing member operatively positioned between said operating rod and said cylindrical block for providing a low frictional contact between said rod and said block such that said cylindrical block is permitted to rotate under an inertial force substantially independent of said operating rod after said cylindrical block has been disengaged from said record mount rotated at the predetermined high speed.

3,891,797

PLATING AREA MEASURING SYSTEM

Joseph C. Finnell, Fountain Valley, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Dec. 26, 1973, Ser. No. 427,565
Int. Cl.[2] **G01B** *19/58;* **H04N** *7/18*
U.S. Cl. 178—6.8 **7 Claims**

1. An area mmasuring system comprising:

a facimile of a region including areas distinguishable into first and second general types by illumination;

means for illuminating said region;

means for viewing and scanning said illuminated region and producing a signal characteristic to said areas of said region;

means responsive to said characteristic signal and producing digital signals arranged in groups corresponding in size to respective portions of said first type of said areas, said grouped digital signal producing means being selectively operable for a predetermined duration; and

means for counting said grouped digital signals whereby a measurement of the aggregate area of said first type of said areas is obtained, said grouped digital signal producing means including an oscillator for generating a series of high rate digital signals, means for producing a control signal of predetermined duration, said control signal being applied to said oscillator to control output of said digital signals therefrom, and gate means responsive to those portions of said characteristic signal representative of portions of said first type of said areas to pass said digital signals in corresponding size groups to said counting means.

3,891,798

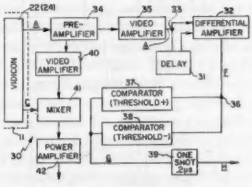
TRACKER UNIT

Thomas J. Marcus, Gahanna, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 19, 1971, Ser. No. 126,288

Int. Cl.[2] H04N *7/18*

U.S. Cl. 178—6.8 **6 Claims**



1. In a tracking system tracker unit which develops tracking error correction signals from a single television camera sensor video signal, in combination:

a. Differential amplifier means having an inverting input terminal, a non-inverting input terminal, and an output terminal, and producing a difference signal at said differential amplifier means output terminal that represents the amplitude difference of the signals then existing at said differential amplifier means input terminals,

b. Video signal delay means,

c. Conductor means transmitting a single television camera sensor video signal to one of said differential amplifier means input terminals delayed in time by said video signal delay means and transmitting said single television camera sensor video signal to the other of said differential amplifier means input terminals not delayed in time by said video signal delay means; and

d. Tracking logic means coincidence gating target marker pulses with tracking gate pulses to develop tracking error correction signals,

said target marker pulses being derived from the amplitude of said differential amplifier means difference signal produced at said differential amplifier means outp[illegible]erminal.

3,891,799

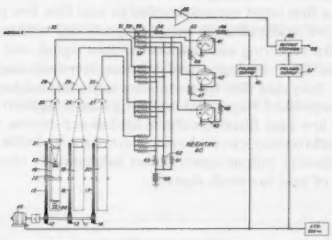
CODING DEVICE WITH LIGHT RESPONSIVE KEY GENERATOR

Alfred E. Melhose, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 27, 1944, Ser. No. 555,912

Int. Cl. H04l *9/02*

U.S. Cl. 178—22 **4 Claims**



1. In a code pulse generating system, a plurality of rotatable opaque members, circular rows of holes through said members, said rows being concentric with the axis of rotation in the case of each member, means to project light through said holes as they pass a given point in the rotation of the member, means to translate the light transmitted through said holes into electrical pulses, said holes in each row having a non-uniform distribution around the row, the spacing between any two adjacent holes being either equal to, or an integral multiple of, the smallest spacing between adjacent holes, such spacing and number of such points differing slightly among the different members, means to rotate each member with a slightly different rotational period from the others, the smallest angular spacing between adjacent holes in the case of all members being proportional to the speed of rotation to cause the pulses that are generated under control of different members to coincide in time, and means to maximize the length of the code cycle between repetitions comprising means to combine the pulses generated under control of the different members into a continuous sequence of pulses, interspersed with spaces in highly irregular order.

3,891,800

LINE TIME BASE IN A TELEVISION RECEIVER

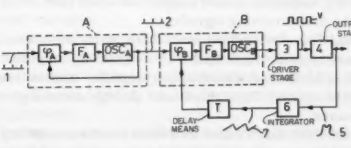
Peter Johannes Hubertus Janssen; Johannes Simon Albert van Hattum, and Jan Abraham Cornelis Korver, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 228,982, Feb. 24, 1972, abandoned. This application Oct. 2, 1973, Ser. No. 402,845

Claims priority, application Netherlands, Mar. 16, 1971, 7103465

Int. Cl. H04n *5/04*

U.S. Cl. 178—69.5 TV **11 Claims**



1. A circuit for synchronizing a sawtooth output signal of a television line output stage in accordance with a pulsatory line

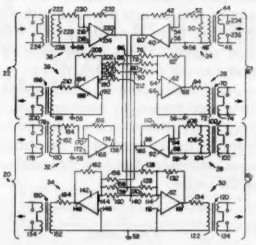
synchronization signal, said circuit comprising said television line output stage comprising sweep means for producing said sawtooth output signal; a first synchronizing circuit including a first phase comparison stage having inputs for respectively receiving said synchronization signal and a first reference signal, a first low pass filter means having a first time constant coupled to said comparison stage and a first oscillator means coupled to said low pass filter means for producing a pulsatory output signal; and means for eliminating phase shifts due to load variations on said line stage comprising a second synchronizing circuit including a second phase comparison stage having a first input means coupled to said first low pass filter to receive said pulsatory output signal and a second input means for receiving said sawtooth output signal, and a second low pass filter having a second time constant substantially smaller than said first time constant and coupled to said second comparison stage, and control means responsive to said second low pass filter to control said sweep means, said second synchronizing circuit having a synchronized state wherein said pulsatory output signal pulses substantially occur at the middle of said sawtooth signal.

3,891,801

FOUR-WAY FOUR-WIRE ACTIVE BRIDGE

Kuei-Seng Wang, Flemington, N.J., assignor to Quindar Electronics, Inc., Springfield, N.J.

Filed Jan. 21, 1974, Ser. No. 434,938
Int. Cl. H04m *3/56*
U.S. Cl. 179—1 CN **11 Claims**



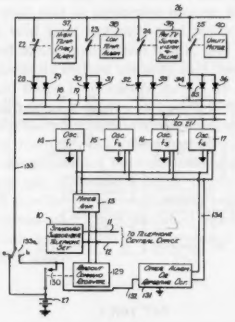
1. An active four port bridge comprising:
a. first, second, third, and fourth distribution amplifier means, each of said distribution amplifier means adapted to receive an input signal; and
b. first, second, third and fourth summing amplifier means, each of said summing amplifier means adapted to transmit an output signal related to said input signal, one of said distribution amplifier means and one of said summing amplifier means coupled to each port for transmitting and receiving signals;
c. said first distribution amplifier means connected only to said second, third, and fourth summing amplifier means;
d. said second distribution amplifier means connected only to said first, third, and fourth summing amplifier means;
e. said third distribution amplifier means connected only to said first, second and fourth summing amplifier means;
f. said fourth distribution amplifier means connected only to said first, second, and third summing amplifier means;
g. said first summing amplifier means operative to sum signals from said second, third and fourth distribution amplifier means, said second summing amplifier means operative to sum signals from said first, third and fourth distribution amplifier means, said third summing amplifier means operative to sum signals from said first, second and fourth distribution amplifier means, said fourth summing amplifier means operative to sum signals from said first, second and third distribution amplifier means;
h. said input signal applied to one of said distribution amplifier means is fed only to said summing amplifier means operatively connected to said distribution amplifier means to which said input signal is applied.

3,891,802

APPARATUS AND METHOD FOR AUGMENTING A TELEPHONE NETWORK

Everhard H. B. Bartelink, Concord, N.H., assignor to Northeast Electronics Corporation, Concord, N.H.

Continuation-in-part of Ser. No. 798,625, Feb. 12, 1969, abandoned. This application Jan. 15, 1971, Ser. No. 106,711
Int. Cl. H04m *1/06*
U.S. Cl. 179—2 A **18 Claims**



14. In a telephone system comprising a central office having connected thereto over circuits individual thereto a plurality of subscriber's telephone stations, each located within premises provided with facilities subject to abnormal variations including at least one of the group consisting of heat, power and water, the method of repetitively monitoring from said central office a condition of said premises subject to abnormal variation, said method comprising: sensing at said station the occurrence of a preselected variation of said condition from a preselected value thereof; generating at said station in response to said variation, a distinctive tone frequency signal within the transmission frequency band of said station; transmitting said signal over said subscriber's circuit to said central office, while repetitively scanning said plurality of circuits at said central office, and upon receipt of said tone signal over any said subscriber's circuit, idenetifying the circuit over which said tone signal is received; and indicating the said variation in said condition occurring at said subscriber's station.

3,891,803
SINGLE SIDEBAND SYSTEM FOR DIGITALLY PROCESSING A GIVEN NUMBER OF CHANNEL SIGNALS

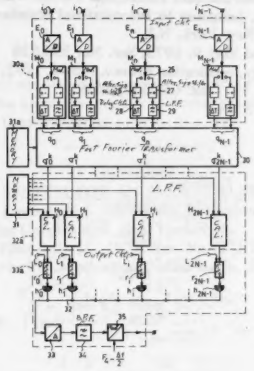
Jacques Lucien Daguet, St. Maur; Maurice Georges Bellanger, Antony, and Guy Pierre Lepagnol, Sceaux, all of France, assignors to Telecommunications Radioelectriques T.R.T., Paris, France

Filed June 1, 1973, Ser. No. 366,073

Claims priority, application France, June 15, 1972, 72.21646

Int. Cl. H04j *1/18*

U.S. Cl. 179—15 FS **4 Claims**



1. A single sideband system for digitally processing a given number of analog channel signals each having a given bandwidth, said system comprising an input circuit including a converter means for sampling and converting the channel signals into a number of digital signals; a cascade arrangement coupled to said input circuit and including a Fast Fourier transformer means and a digital filter coupled to said transformer means, said digital signals being applied to said cascade arrangement; a source for generating signals representative of a given number of filter coefficients coupled to said digital filter, said filter coefficients characterizing the transfer function of a lowpass filter having a cut-off frequency which is equal to half the bandwidth of said channel signals; a source for a given number of carrier signal functions coupled to said transformer means, said number of carrier signal functions being at least equal to twice the number of channel signals, said carrier functions representing carrying frequencies each being an even multiple of the cut-off frequency of said lowpass filter said analog channel signals comprising a given number of baseband channel signals, said input circuit including a number of parallel signal channels, said number corresponding to the number of baseband signal channels, each of said channels including a converter means for sampling each baseband channel signal with the associated Nyquist frequency, said signal channels each including a modulator coupled to said converter means, the transformer means having inputs coupled to said modulators for generating a number of first sum signals each being proportional to the sum of products of output signals from said modulator and carrier signal functions, said transformer means having a number of output leads which number is equal to the number of first sum signals, said output leads being coupled to the digital filter, said filter having a number of signal channels said number corresponding to the number of output leads, each signal channel being coupled to the number of output leads and each including a convolution means coupled to said filter coefficient source for generating a second sum signal which is proportional to the sum of products of first sum signals and filter coefficients applied to said convolution means, means for applying said second sum signals in the rhythm of successively occurring read signals to a common output lead for generating a frequency division multiplex signal in an auxiliary frequency band, an output circuit, means for applying said multiplex signal to said output circuit, said output circuit comprising a digital-to-analog converter and a second modulator means coupled to said digital to analog converter for transposing said frequency division multiplex signal from the auxiliary frequency band to said given frequency band.

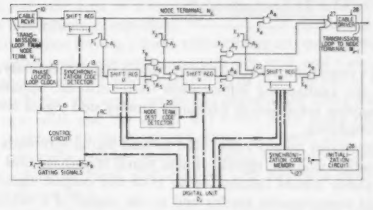
3,891,804
ASYNCHRONOUS DATA TRANSMISSION ARRANGEMENT

Victor Hachenburg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 12, 1973, Ser. No. 397,122

Int. Cl. H04j *3/08*

U.S. Cl. 179—15 AL **8 Claims**



2. In a transmission arrangement for serially communicating digital messages each comprising a destination address portion, a source address portion, and a data portion between a plurality of transmission terminals serially connected in a transmission loop, a transmission terminal having a unique identification code comprising:

an input port;

an output port;

a first serial storage means comprising a serial input terminal and a serial output terminal;

means for connecting said serial input terminal of said first storage means to said input port;

a second serial storage means, having less storage capacity than required to store an entire one of said digital messages, comprising a serial input terminal and a serial output terminal;

first gating means for gating signals from the output terminal of said first serial storage means to the input terminal of said second storage means;

detector means responsive to signals stored in said second serial storage means for generating local destination code control signals indicating that the destination address of a received message is the unique identification code of the respective transmission terminal;

second gating means connected to said serial output terminal of said second storage means for gating signals to said output port;

serial information storage means having sufficient capacity to store the source address portion and data portion of a digital message;

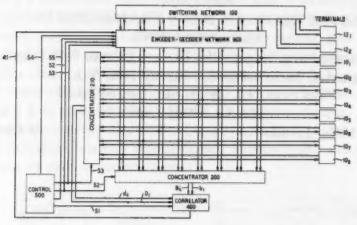
means responsive to said local destination code control signals for inhibiting said first gating means from gating signals to said second serial storage means and for inhibiting said second gating means from gating signals to said output port;

third gating means responsive to said local destination code control signals for gating signals from the output terminal of said first storage means to said serial information storage means.

3,891,805
DIGITAL SIGNAL DETECTION IN TELEPHONIC COMMUNICATION SYSTEMS

James Loton Flanagan, 20 Sage Dr., Warren, N.J. 07060, and Nuggehally Sampath Jayant, 30 Elm St., Morristown, N.J. 07960

Filed Nov. 21, 1973, Ser. No. 417,880
Int. Cl. H04j *3/14*
U.S. Cl. 179—15 BF **16 Claims**



1. In a communication system including signal terminals and means for exchanging information therebetween, apparatus for detecting information exchange among said signal terminals comprising:

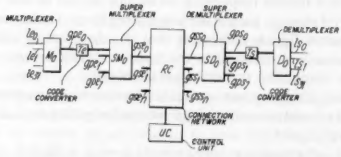
concentrator means connected to said signal terminals for multiplexing the signals of said signal terminals; and

correlator means responsive to both the output signal of said concentrator means and to the signal of a selected one of said signal terminals for correlating said concentrator's output signal with the signal of said selected signal terminal to develop a signal indicative of which of said signal terminals exchange information with said selected signal terminal.

3,891,806
SYSTEM FOR PREVENTING INTELLIGIBLE CROSSTALK IN TDM SWITCHING SYSTEMS

André Edouard Joseph Chatelon, Montrouge, and André Lucien Coudray, Buzenval Par Rueil-Malmaison, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,550
Claims priority, application France, Dec. 15, 1972, 72.44665
Int. Cl. H04j *3/10*
U.S. Cl. 179—15 AN **3 Claims**

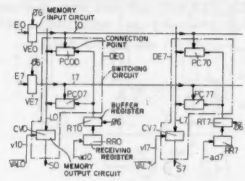


1. A protective system to prevent the occurrence of intelligible crosstalk between time division channels comprising, code conversion means coupled near the inputs of a time division switching center, said code conversion means receiving incoming time division signals including a polarity bit and coded combinations of amplitude bits, said code conversion means transmitting the polarity bit unchanged, said code conversion means responding to a polarity bit of a first value to transmit the amplitude bits unchanged and to a polarity bit of the opposite value to invert the amplitude bits and then transmit them, and, complementary code conversion means coupled at the outputs of the center, said complementary code conversion means transmitting the polarity bit unchanged and inverting the amplitude bits of the coded combinations when the polarity bit has said particular value, whereby when one channel is silent, the coded combinations inserted into the center are never null or almost null, but on the contrary take values adapted to mask at least partly possible disturbing signals, and destroy intelligibility of said disturbing signals.

3,891,807
ELECTRONIC SWITCHING MODULE

Pierre Charransol; Jacques Hauri, and Claude Athenes, all of Paris, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 9, 1973, Ser. No. 358,628
Claims priority, application France, May 9, 1972, 72.16447
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 BS **4 Claims**



1. A switching module for time division multiplex signals comprising: a plurality of first circuits including switching means of a first type forming inputs; a plurality of second circuits including switching means of a second type forming outputs; multistage switching circuits for connecting each of the inputs to any one of the outputs for the selective transmission of data signals; said first circuits including an input memory stage for receiving a data signal during a relatively short time interval corresponding to a relatively short fraction of a channel time slot and thereafter storing it and holding it during a relatively long fraction of a channel time slot; said input memory stage thereby disassociating reception of the data signal from retransmission and preparing the data signal to be connected step-by-step and stage-by-stage through the multistage switching circuits to the outputs.

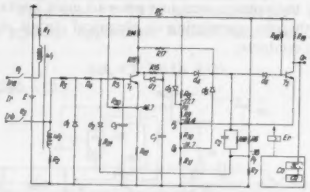
3,891,808
DIAL PULSE RECEIVER

Marcel A. Van Brussell, Hoboken, Belgium, and Raymond Louis Julia-Pollé, Sydney, Australia, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 5, 1973, Ser. No. 337,829
Claims priority, application Belgium, Mar. 6, 1972, 780235
Int. Cl. H04q *1/36*
U.S. Cl. 179—16 EA **23 Claims**

1. A two-level signalling system for providing output pulses at an output corresponding to DC pulses of a prescribed duration received on its input and for preventing DC pulses of shorter than a prescribed duration reaching the output comprising first and second input terminals coupled respectively between battery and ground potentials to receive input pulses, means coupled to said input terminals to eliminate input pulses having less than a predetermined duration and to transmit pulse having a predetermined duration, said means to eliminate input pulses including first means responsive to input pulse signals to energize first and second delay means, said delay means being able to effectively react to positive and negative level changes and to provide output signals to trigger

a bistate device to a first or a second state respectively, indicating pulses have been received on the input terminals or not,



said first and second delay means producing output signals only when the level changes occur during predetermined first and second time durations.

3,891,809
MAGNET SYSTEM FOR AN ACOUSTIC TRANSDUCER

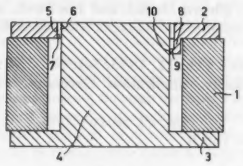
Derk Kleis, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 19, 1972, Ser. No. 273,299

Claims priority, application Netherlands, July 29, 1971, 7110445

Int. Cl. H04r *9/02*

U.S. Cl. 179—119 R **8 Claims**



1. A magnet system for an acoustic transducer comprising, a main magnet and a ferromagnetic circuit which cooperates with the main magnet, said ferromagnetic circuit including a centrally arranged ferromagnetic core and a ferromagnetic upper plate having an opening therein which; together with the centrally arranged core, defines an annular effective air gap, said upper plate including a centering member integral therewith and made of the same ferromagnetic material as the upper plate and comprising at least three circumferentially arranged reentrant projections on the inner edge of the upper plate with a part of each projection being dimensioned so that in operation said projection part is magnetically saturated, said core being centered wtih respect to the upper plate by means of the centering member the larger part of which is located at the lower end of the effective air gap.

4. A magnet system for an acoustic transducer comprising, a main magnet and a ferromagnetic circuit which cooperates with the main magnet, said ferromagnetic circuit including a centrally arranged ferromagnetic core and a ferromagnetic upper plate having an inner portion approximately coaxial with the core and adjacent to one end of said centrally arranged core and a peripheral portion with an opening that defines an annular effective air gap separatingg the inner and peripheral portions of the upper plate, said upper plate including a centering member for centering the core with respect to the upper plate and comprising at least three circumferentially spaced bridge members integral with the inner and peripheral portions so that the parts of the upper plate form a unitary piece and with all parts thereof made of the same ferromagnetic material.

3,891,810
HEADPHONE

Naotake Hayashi, No. 25-5, 1-chome, Zoshigaya, Toshima-ku, Tokyo, Japan

Filed Aug. 28, 1973, Ser. No. 392,370

Claims priority, application Japan, Sept. 1, 1972, 47-87623

Int. Cl. H04m *1/05;* **H04r** *1/10*

U.S. Cl. 179—156 R **3 Claims**

1. A headphone set including a pair of headphones adapted to fit over the ears of a user and connected by a head band, each headphone comprising:

a sound box having a front wall defining an opening therein, upper and lower walls, an outer side wall, and a rear wall, the sound box being adapted to fit over the ear of a user such that the inner peripheral edges of the front wall, the rear wall, and the upper and lower walls make intimate contact with the head and cheek of a user, and

a generally planar electro-acoustic transducer mounted within the front wall opening and having a perforated exterior face,

said electro-acoustic transducer having an axis generally perpendicular to the plane of the transducer inclined outwardly from the front-rear axis of the users head at an angle of between 20° to 30°.

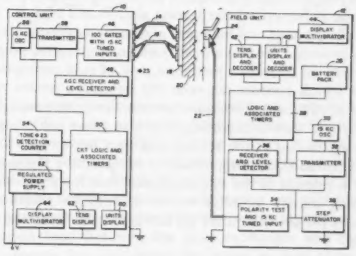
3,891,811
WIRE PAIR IDENTIFICATION SYSTEM

Arthur O. Miller, Dallas, Tex., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 16, 1973, Ser. No. 389,011

Int. Cl. H04b *3/46*

U.S. Cl. 179—175.3 A **56 Claims**



1. A system for remotely identifying individual wire pairs in a multipair cable, comprising in combination:

control means electrically connected to each individual wire pair of the multipair cable for sequentially scanning the pairs for a frequency signal and generating an identifying code in response thereto; and

test means electrically connected to a selected wire pair of the multipair cable, said test means comprising: means for transmitting a frequency signal over the selected wire pair to said control means, means for receiving from said control means over the selected wire pair the identifying

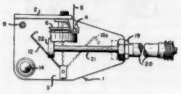
code generated thereby, and display means for converting said identifying code into a numerical display representing the selected wire pair.

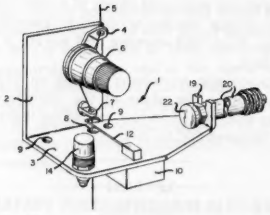
3,891,812

DETECTOR DEVICE OF THREAD BREAKAGE ON A SEWING MACHINE

Nerino Marforio, Milan, Italy, assignor to Virginio Rimoldi & C. S.p.A., Milan, Italy

Filed Apr. 18, 1974, Ser. No. 461,842
Claims priority, application Italy, May 22, 1973, 24370/73
Int. Cl. B65h *25/14*
U.S. Cl. 200—61.18 **3 Claims**





1. In an electrically operated sewing machine having circuitry for operating the machine depending upon the presence or absence of fabric at the sewing station the combination of means to detect the presence of sewing thread at the sewing station and to cause stopping of the sewing machine only after no fabric is present at the sewing station and after no sewing thread is present, said means comprising, thread detecting means mounted for movement from an inoperative position to a plurality of operative positions, one of said positions being one in which contact between the detecting means and the thread occurs, when thread is present, switching means operated by said thread detecting means to close and to open the operating circuit of the sewing machine, and means for holding said thread detecting means in an operative position when fabric is present at the sewing station and for permitting said detecting means to move to an inoperative position if no thread is present and after all fabric is gone from the sewing station.

3,891,813

EHV CIRCUIT BREAKER UTILIZING GALLIUM CATHODE IGNITRONS FOR SYNCHRONOUS CLOSING

Kue H. Yoon; Robert E. Friedrich, and Andreas M. Sletten, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

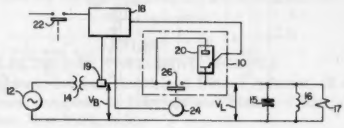
Filed May 4, 1973, Ser. No. 357,437
Int. Cl. H01h *33/16*
U.S. Cl. 200—144 AP **10 Claims**

1. A high voltage synchronous closing circuit breaker for use on an alternating current circuit above 100 KV, comprising:

a housing,

main contact means disposed in said housing and being movable between an open and a closed position;

synchronous closing means connected in parallel with said main contact means for synchronously closing at substantially the voltage zero just prior to main contact closing and thereby completing an electrical circuit around said main contacts;



said synchronous closing means comprising a gallium cathode ignitron means having an anode, a cathode and a trigger disposed within a sealed housing;

said anode directly connected to one side of said main contact means and said cathode directly connected to the other side of said main contact means;

said gallium cathode ignitron means constructed to have greater than a 100 KV withstand level thereacross;

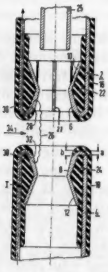
trigger actuating means connected to said trigger to trigger said gallium cathode ignitron within 100 microseconds of a voltage zero.

3,891,814

APPARATUS FOR ARC QUENCHING

Walter Hertz; Jürgen Mentel, and Jan Stroh, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 22, 1973, Ser. No. 334,936
Claims priority, application Germany, Feb. 28, 1972, 2209388
Int. Cl. H01h *33/60*
U.S. Cl. 200—148 R **14 Claims**

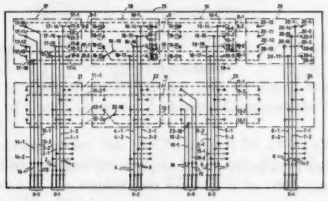


1. In a quenching medium flow circuit, breaker where at least one of the contacts is in the form of a nozzle tube comprising a cylindrical tube of a conductive material having a looped end consisting of a portion of the tube looped inside the tube to form a nozzle, wherein the improvement comprises; insulating means covering the outer surface of the cylindrical tube at least in the vicinity of the looped end, covering the looped end, and covering a small portion of the inside nozzle adjacent to the looped end for a distance equal to or greater than the thickness of said tube at said looped end, the portion of the outer surface being covered for a distance which is sufficiently greater than the small inside nozzle portion covered so that an arc is drawn inside said nozzle whereby a current path through said looped end will be followed to set up magnetic forces tending to extinguish the arc.

3,891,815
PRINTED CIRCUIT BOARD FOR A SWITCHING NETWORK

Adrianus Leonardus Hiele, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1973, Ser. No. 351,823
Claims priority, application Netherlands, Apr. 27, 1972, 7205680
Int. Cl. H01h *3/02*
U.S. Cl. 200—175 **2 Claims**



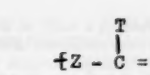
1. A circuit arrangement for switching network comprising: a supporting board; a plurality of groups of pairs of upper conductive tracks disposed on one surface of the board and extending substantially parallel to one another; input terminals connected to assigned groups of said upper conductive tracks, and output terminals connected to at least one remaining group; a plurality of multicontact switching means disposed on said one surface of the board and each having connection terminals for respective switching contacts; a plurality of interconnections passing through the board and arranged to form a first pattern for accommodating said connection terminals and a second pattern connected to respective upper conductive tracks in consecutive order to face corresponding interconnections of said first pattern; a plurality of lower conductive tracks disposed on the opposite surface of the board and connected between said interconnections for providing, together with said switching means, optional signal paths between said input and output terminals; two interconnections in said second pattern pertaining to a pair of tracks for a switching means having reversed order with respect to the order of interconnections on the adjacent pair of tracks in a group, for providing, by means of contacts of said switching means, a disconnectable cross-point between the conductive tracks for a selected signal path, and further comprising an additional interconnection passing through the board near a side of a track assigned to another switching means and being connected to a corresponding interconnection in said first pattern by a lower conductive track to form a permanent cross-point.

3,891,816
PREPARATION OF GRAFT, BLOCK AND CROSSLINKED UNSATURATED POLYMERS AND COPOLYMERS BY OLEFIN METATHESIS

Kenneth W. Scott, Cuyahoga Falls, and Nissim Calderon, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 882,270, Dec. 4, 1969, Pat. No. 3,692,872. This application June 5, 1972, Ser. No. 259,881
Int. Cl. C08d *9/10*
U.S. Cl. 260—889 **9 Claims**

1. A chemical process involving exposure of two or more dissimilar polymeric substances that are characterized by being free of any non-aromatic conjunction and comprised of structural units of the general formula (V):



(V)

wherein:

A T is 1. hydrogen; or

2. a substituent corresponding to the formula D—CH_2—, where D is any member of the group: alkyl, aryl, aralkyl, alkaryl, alkenyl, cycloalkyl, cycloalkenyl, bicycloalkyl, bicycloalkenyl, and hydrogen; and

B. Z represents hydrogen or a structure having at least one carbon atom and any of the said Z carbons may be:

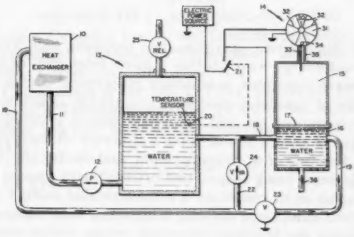
1. interconnected by single or double bonds;
2. substituted by one or more members of the group alkyl, aryl, aralkyl, alkaryl, alkenyl, cycloalkyl, bicycloalkyl, cycloalkenyl and bicycloalkenyl;
3. constituents of aromatic, alicyclic or chlorinated alicyclic rings;

to a catalyst capable of inducting the olefin metathesis reaction and of inducing ring--opening polymerization, said catalyst which will convert 2-pentene into 2-butene and 3-hexene at temperatures lower than about 100°C, leading to products which are interpolymers of the starting reactant polymeric substances.

3,891,817
HYDRONIC HEATING SYSTEM

Harold Brown, 3629 Suitland Rd. S.E., Washington, D.C. 20020

Filed Feb. 1, 1974, Ser. No. 438,555
Int. Cl. H05b *1/02, 9/06;* **F24h** *3/06*
U.S. Cl. 219—10.55 R **1 Claim**



1. A hydronic heating system comprising a heat exchanger, a container for water, means for heating water in the container comprising a source of micro-wave energy, a guide means having walls which reflect micro-wave energy generated by the said source and direct the micro-waves towards the container, a wall common to said guide means and said container which is transparent to microwaves, means forming a closed circulation loop between the heat exchanger and the container, means for circulating the water in said closed loop between the heat exchanger and the container, a water storage means between the outlet of the container and the inlet of the heat exchanger and having means for accommodating expansion of water in the system and for the escape of air from the system, by-pass means in the circulation loop between the heat exchanger and the container for by-passing the container to allow water flowing from the heat exchanger to flow directly to the storage means, a check valve in said by-pass means which prevents flow of water from the container through the by-pass means, and means responsive to the temperature of the water in the system externally of the container for directing flow of water from the heat exchanger to the storage means while by-passing the container, said tempera-

ture responsive means comprising a valve in the circulation loop downstream of the by-pass means for diverting flow of water flowing from the heat exchanger towards the container into the by-pass, and thermostatic means for simultaneously activating the source of micro-wave energy and opening the last said valve for flow of water from the heat exchanger into the container when the temperature of the water in the system externally of the container is below a predetermined temperature and for simultaneously deactivating the source of microwave energy and closing said valve to divert the water from the heat exchanger through said by-pass means into the storage means when the temperature of the water in the system externally of the container is at least equal to said predetermined temperature.

3,891,818

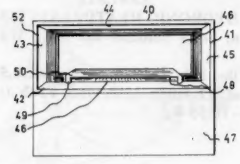
FILTERING DEVICE FOR RESTRICTIVELY PROPAGATING INCOMING HIGH-FREQUENCY WAVES

Bo Valtersson Valtersson, Hagersten, Sweden, assignor to Husqvarna Vapenfabriks AB, Huskvarna, Sweden

Division of Ser. No. 184,169, Sept. 27, 1971, abandoned. This application May 4, 1973, Ser. No. 357,280

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 F **4 Claims**



1. A filter device operable upon incoming high-frequency electrical energy waves within a given frequency range in a microwave apparatus, said device comprising: a base, and a plurality of parallel spaced apart electrically conductive elements supported on said base, said spaced elements being arranged in groups and defining a structure which is periodic in the direction of wave propagation, said electrically conductive elements being shaped and oriented with respect to one another so as to constitute a predetermined mutual capacitance and inductance defining a high-pass filter means which propagates the incoming electrical energy waves within the given frequency range with counter-directional phase velocity and group velocity, the phase velocity of the waves in said high-pass filter means being at least as great as the phase-velocity at which the electrical energy waves are propagated in the vicinity of said filter means, and means connected to said filter device for receiving the incoming high-frequency electrical energy.

3,891,819

AUTOMATIC SET-UP ELECTROEROSION MACHINING METHOD

Werner Ullmann, Locarno; Bernd Schumacher, Losone; Arno Sieg; Silvano Mattei, both of Locarno; Hans-Ueli Fenner, Ascona; Gottlieb Wettstein, and Herbert Ruh, both of Locarno, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE, Losone, Switzerland

Filed Jan. 21, 1974, Ser. No. 435,206

Claims priority, application Switzerland, Aug. 15, 1973, 11780/73

Int. Cl. B23p *1/08*

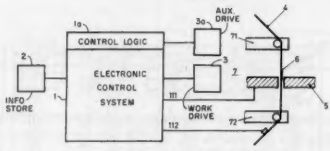
U.S. Cl. 219—69 M **9 Claims**

1. Method for electroerosion machining a workpiece having a starting bore by using as the machining tool a long drawn out flexible electrode capable of being gradually dispensed, comprising the steps of:

aligning said starting bore (9) of said workpiece (5) with an unencumbered straight line path provided for said electrode (4) by an electrode drive and guiding system (7);

dispensing said electrode (4) from an electrode supply by means of said electrode drive and guiding system (7);

threading said electrode (4) automatically by propelling it by said system in said straight line path into, through and out beyond said bore (9) of said workpiece (5) until the



end of the electrode becomes firmly engaged in transport means (79) of a take-up mechanism (71) of said electrode drive and guiding system; and then

dispensing said electrode gradually through said workpiece (5) and said take-up mechanism (71) of said system (7) while applying electroerosion voltage thereto relative to said workpiece and subjecting said electrode and workpiece to relative movement under control of an automatic electronic machining drive system to machine a predetermined contour (8) in said workpiece.

3,891,820

WELD-PLATING OF STEEL

Werner Debray, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 17, 1972, Ser. No. 281,555

Claims priority, application Germany, Aug. 25, 1971, 2142460

Int. Cl. B23k *1/20*

U.S. Cl. 219—76 **4 Claims**

1. A process for weld-plating austenitic stainless steel on the surface of a hardenable carbon steel part; wherein the improvement comprises decarbonizing said surface and thereafter weld-plating the stainless steel thereon.

3,891,821

METHOD FOR REPAIRING IRON MOLDS USED IN STEEL MAKING, CASTING PLATES IN IRON MOLDS AND OTHER OBJECTS MADE OF CAST IRON

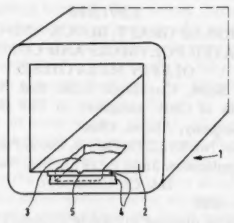
Egon Evertz, Vorlander Strasse 23, 565 Solingen, Germany

Filed May 24, 1973, Ser. No. 363,407

Claims priority, application Canada, May 24, 1972, 142869

Int. Cl. B23k *9/04;* **B22d** *19/10*

U.S. Cl. 219—76 **7 Claims**



1. A method of repairing damaged parts of iron molds used in steelmaking, or damaged casting plates in iron molds or

damaged parts of other objects made of cast iron, such as hermatite, gray cast iron and steel pig which are subjected in use to heat, first removing all impurities adhering to the surface of damaged parts, applying by means of at least one sheathed welding steel electrode, a molten layer of steel to the damaged area, and then applying further molten layers onto said first-mentioned layer from current-carrying welding steel electrodes and gray cast iron electrodes, with at least the last layer to be applied being a molten gray cast iron layer from a current-carrying gray cast iron electrode in which a zone of at least cm^2 of said molten layer of steel is kept molten by a welding current of at least 1000 amperes.

3,891,822

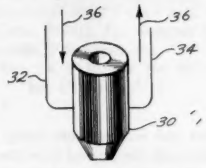
PULSE HEATED THERMOCOMPRESSION BONDING APPARATUS

Joseph L. Laub, Claremont, and John F. Hurst, San Gabriel, both of Calif., assignors to Unitek Corporation, Monrovia, Calif.

Continuation of Ser. No. 135,722, April 20, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 347,225

Int. Cl. B23k *1/02*

U.S. Cl. 219—85 **9 Claims**



1. A pulse-heated thermocompression wire bonding apparatus comprising;

a capillary bonding tip having a wire to be bonded threadedly extending therethrough;

a holder supported by the bonding apparatus for receiving the tip in a thermal transfer relationship therewith;

electric power supply means connected to the holder;

means for moving the holder and tip such that the wire is contacted to a bonding location;

temperature control means connected to the power supply for limiting the amount of electric current heating energy supplied to the holder to an amount sufficient to raise the tip to a predetermined bonding temperature;

temperature monitoring means disposed in a sensing relationship with respect to the holder connected to the power supply means for interrupting the supply of electric current heating energy upon attainment of the predetermined bonding temperature at the holder and tip;

timing means responsive to the sensing of a predetermined temperature of the holder by the temperature monitoring means for maintaining contact of the wire of the bonding location for a predetermined interval of time;

feedback means interconnecting the power supply and temperature monitoring means for causing additional electric current heating energy to be supplied to the holder to maintain the temperature of the tip at the predetermined bonding temperature during the interval of contact of the wire at the bonding location; and

means for interrupting the supply of electric current heating energy to the tip responsive to termination of the bonding interval.

3,891,823

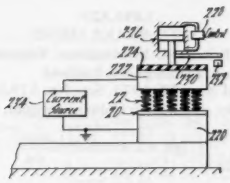
METHODS FOR THE MANUFACTURE OF SPRING ASSEMBLIES

Donald O. Dulude, and Paul H. Winbigler, both of Coldwater, Mich., assignors to Kuhlman Corporation, Troy, Mich.

Division of Ser. No. 331,750, Feb. 13, 1973, which is a division of Ser. No. 203,534, Dec. 1, 1971, Pat. No. 3,782,708. This application Nov. 23, 1973, Ser. No. 418,686

Int. Cl. B23k *1/04*

U.S. Cl. 219—85 **2 Claims**



1. The method of manufacturing a spring assembly including a sheet metal annular base and a plurality of springs disposed on and extending in free and unrestrained spaced parallelism from the base which comprises the steps of disposing a thin annulus of brazing material on the base and placing the plurality of springs in spaced parallelism and projecting in one direction from the annular base and seated on the annulus of brazing material, applying clamping compressive forces to the assembly to maintain the springs in position on the brazing material and base, and heating the clamped assembly to a temperature which is sufficient to both braze the plurality of springs to the base and to stress relieve the springs.

3,891,824

METHOD OF PLASMA-MIG-WELDING

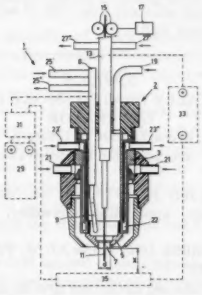
Wilhelmus Gerardus Essers, and Gerardus Jelmorini, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 237,391, March 23, 1972, abandoned. This application Nov. 23, 1973, Ser. No. 418,296

Claims priority, application Netherlands, Apr. 1, 1971, 7104337

Int. Cl. B23k *9/00*

U.S. Cl. 219—121 P **4 Claims**



1. A method of plasma-MIG welding a workpiece, comprising the steps of feeding a stream of inert gas through a nozzle aperture towards said workpiece, generating a plasma stream by connecting a non-consumable electrode to the positive side of a current supply means and by maintaining a continuous

plasma arc between said non-consumable electrode and said workpiece within said stream of inert gas, feeding a consumable weld wire axially into said plasma stream, maintaining a continuous MIG arc between said consumable wire electrode and said workpiece by connecting said electrode to the positive side of a current supply means and flowing current therethrough, while maintaining said plasma stream substantially concentrically about said MIG-arc, and varying the current through said consumable weld wire for varying the character of the MIG arc and material transfer from said weld wire.

3,891,825

LINED BRAKE SHOES

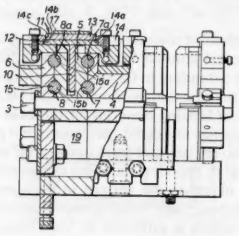
Gethyn James Pritchard, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 28, 1973, Ser. No. 419,661

Claims priority, application United Kingdom, Nov. 28, 1972, 54955/72

Int. Cl. H05b *3/02*

U.S. Cl. 219—243 **5 Claims**



1. An apparatus for bonding a layer of friction material to a brake shoe including an arcuate platform having a convex surface for receiving said layer of friction material and an opposed concave surface and a web extending from said concave surface of said platform, said apparatus comprising shoe support means, means for positioning said shoe on said support means comprising a plurality of abutment members each having a clamping portion arranged to clamp said shoe platform against said support means and an abutment portion for locating said layer of friction material on said platform, retaining means for holding said layer of friction material against said convex surface of said shoe platform, and a pair of electrical heating elements disposed one on each side of said web of the shoe, each heating element having a heating portion and at least one tail portion connected thereto, wherein said heating portions extend adjacent said web of said shoe along the whole length of said web.

3,891,826

ELECTRICALLY HEATED SMOKE OR STEAM GENERATOR

Eberhard Seuthe, deceased, late of Uhingen, Germany, and by Ellen Seuthe, executrix, 60 Romerstrasse, Uhingen, Germany

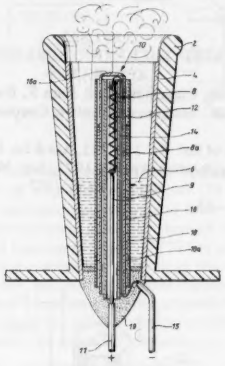
Filed July 30, 1973, Ser. No. 383,829

Claims priority, application Germany, Aug. 5, 1972, 2238733

Int. Cl. H05b *3/00;* **A63h** *33/28;* **F22b** *1/28*

U.S. Cl. 219—273 **3 Claims**

1. A smoke producing device for toys including a container for holding a chemical evaporating medium and having a closed bottom end; a first imperforate tube of electrically insulating material constructed as a capillary, mounted in the said bottom of the container and extending longitudinally from said bottom end towards the opposite end of the container; an electrical heating resistance coaxially mounted within the bore of said first tube and having electrical connections thereto extending from each end of the first tube; a second imperforate tube of electrically insulating material substantially co-extensive in length with said first tube and spaced from and coaxially mounted by its lower end relative to the first tube in the bottom end of the container; a connection to the upper end of the heating resistance extending between the walls of the first and second tubes and through the bottom end of the container; a connection to the lower end of the heating resistance extending through the bottom of the container; a pair of electrically conductive wires mounted externally of the bottom end of the container connecting said electrical connections to a voltage source; a third tube surrounding the first and second tubes being spaced from and coaxially mounted with the second tube, the spacing between the second and third tube being independent of the spacing between the first and second tubes and being open at the top; and means provided in the third tube and located towards the closed bottom end of the container for admitting evaporating medium in the container into the space between the second and third tubes, wherein when the pair of conductive wires is connected to a source of voltage the temperature of the heating resistance increases to evaporate the evaporating medium in the space between the second and third tubes to provide smoke or steam which is emitted from the open upper end of the third tube.



3,891,827

ELECTRICAL HEATING DEVICE FOR USE WITH AEROSOL CONTAINERS

Harold G. Wyse, Dayton, Ohio, assignor to Gad-Jets, Inc., Dayton, Ohio

Filed Jan. 12, 1973, Ser. No. 323,037

Int. Cl. H05b *1/02;* **B67d** *5/62;* **F24h** *1/12*

U.S. Cl. 219—302 **21 Claims**

1. An electrically and heat insulated heater comprising:

a. a heat exchanger,

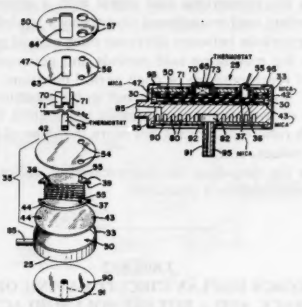
b. means forming a heating element cavity within a portion of said heat exchanger,

c. electric heating element means in said heating element cavity in thermal contact with said heat exchanger,

d. temperature control means, including a low mass, sealed thermostat mounted upon and in thermal contact with said heating element means and substantially free of contact with said heat exchanger, to control the supply of electrical current to said heating element for controlling the temperature of said heat exchanger,

e. an electrically and heat resistant material sealing said heating element and said thermostat in said cavity to insulate and isolate them electrically and from electrically conductive fluids, and

f. a heating element cover plate mounted on said heat exchanger between said electrical heating element means



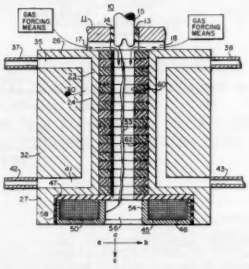
and said heat resistant material, said cover plate being free from contact with said thermostat.

3,891,828

GRAPHITE-LINED INERT GAS ARC HEATER

Serafino M. De Corso, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1973, Ser. No. 407,724
Int. Cl. H05b *7/18*
U.S. Cl. 219—383 **13 Claims**



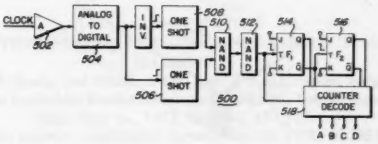
1. An arc heater comprising, first and second spaced electrodes adapted to have an electrical arc struck therebetween for heating gas, said electrodes being electrically insulated from each other, a hollow housing means having an elongated arc chamber disposed between said electrodes and electrically insulated therefrom, pressure means for admitting gas to be heated by said electric arc into said chamber and means for exhausting gas from said chamber, a pyrolytic graphite liner for the inner wall of said chamber, said graphite liner being characterized by high thermal conductivity in a direction transverse to the longitudinal axis of said arc chamber and by relatively low thermal conductivity in the direction parallel to the axis of the chamber, said graphite liner being characterized by high electrical resistance in the direction parallel to said longitudinal axis of said arc chamber compared to the electrical resistance in a direction transverse to the axis of said arch chamber, mounting means for supporting together the elements of the arc heater.

3,891,829

CODED RECORDS, METHOD OF MAKING SAME AND METHOD AND AN APPARATUS FOR READING CODED RECORDS

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 29, 1973, Ser. No. 392,413
Int. Cl. G06k *7/10, 19/08;* **G08c** *9/06*
U.S. Cl. 235—61.11 E **19 Claims**



1. A machine readable record which may be scanned by means of a manually held scanning instrument, said record comprising:

a base material;

a first set of uniformly spaced and parallel bars printed upon said base material and containing a material which, when stimulated by electromagnetic radiation, strongly emits or reflects electromagnetic radiation within a first frequency range; and

a second set of bars printed upon said base material on top of and parallel to said first set of bars having a minimum width which is at least twice the width of said first set of bars and which, when stimulated by electromagnetic radiation, strongly emits or reflects electromagnetic radiation within a second frequency range, the spacing and/or width of said second set of bars being varied in such a manner as to convey information.

8. A method of transmitting coded data using a printed record member and an optical scanning device comprising the steps of:

pre-printing a plurality of evenly-spaced invisible timing marks having a first optical characteristic which optically distinguishes the marks from the record member upon the record members;

printing groups of plural data marks having a different optical characteristic than said timing marks which optically distinguishes the data marks from the record member and spaced from one another to represent coded information upon the record member superimposed over and parallel to said timing marks;

optically scanning the record to generate a composite optical signal;

separating first and second optical signals from said composite optical signal corresponding respectively to emissions or reflections from said timing marks and said data marks; and

sampling the state of said second optical signal corresponding to said data marks at times when said first optical signal corresponding to said timing marks fluctuates to recover from said second optical signal data corresponding to the information carried by the record.

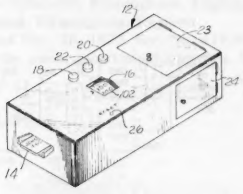
3,891,830
CREDIT VERIFICATION SYSTEM

Robert N. Goldman, Pacific Palisades, Calif., assignor to Telecredit, Inc., Los Angeles, Calif.

Continuation of Ser. No. 150,601, June 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 558,127, June, 1966, Pat. No. 3,610,889. This application Oct. 12, 1973, Ser. No. 406,063The portion of the term of this patent subsequent to Oct. 5, 1988, has been disclaimed.

Int. Cl. G06k *7/08;* **G11b** *1/06;* **G07f** *1/06;* **B67d** *5/10;* **H01h** *43/08*

U.S. Cl. 235—61.7 B **17 Claims**



12. In a system for controlling the aggregate use of a credit card or the like which bears a recording medium, whereby the card is to have a use limit during any of a series of specific time periods and wherein said system includes sensing means for sensing signals from said recording medium, and means for recording signals on said recording medium, the improvement which comprises:

time means for indicating a current one of said time periods;

means coupled to said sensing means for providing use-related signals and time-related signals indicative of a prior aggregate use of said card during a specified period of prior use of said card;

means coupled to said time means, for processing said use-related signals and said time-related signals to provide approval signals upon a detection that the use of said card during said current one of said time periods is within said limited use; and

means coupled to said means for recording, controlled by said means for processing, for providing signals to indicate a selected combination of said use limit with representations of the use of said card during said current one of said time intervals.

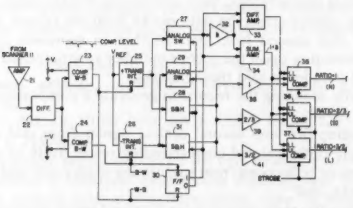
3,891,831
CODE RECOGNITION APPARATUS

Herbert George Coles, Jr., West Upton, Mass., assignor to Data General Corporation, Southboro, Mass.

Filed Dec. 5, 1973, Ser. No. 421,885

Int. Cl. G06k *7/10, 19/06*

U.S. Cl. 235—61.11 E **14 Claims**



1. Apparatus for reading on a record medium a two level code representing at least one character of a set of characters, the code for each character defined by a plurality of consecutive transitional occurrences between the two levels of the code comprising:

means for scanning the record medium to derive a time based electrical signal;

means for converting said signal into a series of pulses denoting said transitional occurrences to define at least four periods between alternate ones of said pulses;

means for measuring said periods and generating a signal level representative of each period duration;

means for comparing the signal levels measured for each one of two overlapping periods to generate three ratios, each ratio representing not more than one of three possible values, and;

means for decoding the values arrived at for said three ratios to define a character.

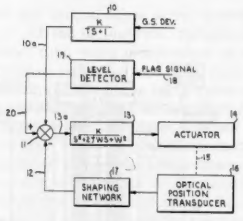
3,891,832
AVIONICS DISPLAY CIRCUIT HAVING OPTICAL FEEDBACK AND A ROTARY SOLENOID ACTUATOR THEREIN

Daniel L. Rodgers, and Thomas F. Cater, both of Olathe, Kans., assignors to King Radio Corporation, Olathe, Kans.

Filed Mar. 23, 1973, Ser. No. 344,234

Int. Cl. G06g *7/78, 7/70*

U.S. Cl. 235—150.2 **10 Claims**



1. An avionics indicator device having an indicator pointer operable to visually indicate aircraft deviation from a preselected condition, said device comprising

a deviation signal input,

means for producing an electrical signal corresponding to the position of said pointer,

means for summing said pointer position signal with said deviation signal input, said summing means having an output signal corresponding to the difference in said deviation signal input and said pointer position signal,

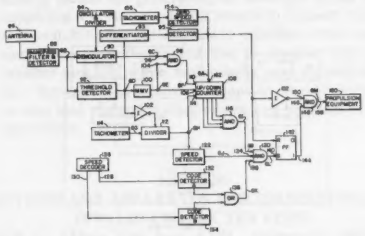
means for positioning said pointer in accordance with the output signal emanating from said summing means, said pointer positioning means including a rotary solenoid, said solenoid having a rotary magnet that is positionable in accordance with said summing means output signal, said indicator pointer being mechanically linked to said rotary magnet and operable to indicate said aircraft deviation, and

wherein said rotary solenoid includes at least one retract pole located adjacent said rotary magnet, said retract pole operable to automatically remove said pointer from view during a flag condition.

3,891,833
VEHICLE COAST CONTROL SYSTEM

Richard S. Rhoton, Monroeville, and Michael P. McDonald, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 5, 1974, Ser. No. 458,381
Int. Cl. B60l *15/40;* **G06f** *15/48*
U.S. Cl. 235—150.2 **7 Claims**



1. In a vehicle coast control system, the combination comprising:

means for providing a first signal coded to indicate the distance said vehicle should travel under tractive effort from a reference position to a coast position at which tractive effort is interrupted;

means for providing a second signal indicative of how far said vehicle has traveled at a given instant of time;

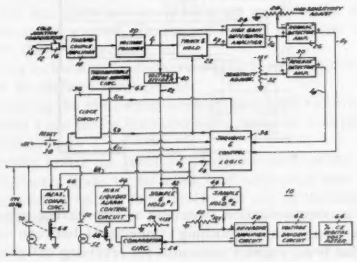
means for comparing the distances represented by said first and second signals on a time dependent basis; and

means for interrupting tractive effort on said vehicle for causing said vehicle to coast at the time said means for comparing senses that the distances represented by said first and second signals are equal.

3,891,834
COOLING CURVE COMPUTER

Robert Warsinski, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 22, 1974, Ser. No. 472,395
Int. Cl.[2] G06F *15/20;* **G01N** *25/02*
U.S. Cl. 235—151.3 **11 Claims**



1. A cooling curve computer for detecting first and second temperatures at which changes occur in the slope characteristic of the cooling curve of a metal alloy sample, said cooling curve computer comprising:

means for generating a first electrical signal proportional to the temperature of said sample;

first circuit means, supplied with said first electrical signal, for detecting said first temperature and said second temperature of said sample, said first electrical signal at said first temperature being characterized by a decrease in the magnitude of the slope of said cooling curve and by the absence of a reversal in the slope thereof and said first electrical signal at said second temperature being characterized by a change in the magnitude of the slope of the said cooling curve with or without a reversal in said slope;

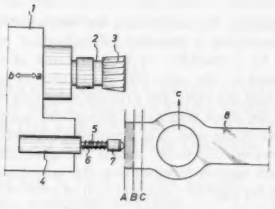
second circuit means for storing signals representative of the magnitudes of said first electrical signal at the times of occurrence of said first and second temperatures; and

third circuit means for generating a second electrical signal having a magnitude mathematically related to the magnitude of said first electrical signal as represented by said signals stored by said second circuit means, said third circuit means utilized said stored signals in the generation of said second electrical signal.

3,891,835
CONTROL SYSTEM FOR A BALANCE CORRECTING MACHINE

Hiroshi Shoda, and Mikio Araki, both of Kaga, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 26, 1972, Ser. No. 257,373
Claims priority, application Japan, May 26, 1971, 46-35513
Int. Cl. B23c *3/00*
U.S. Cl. 235—151.11 **5 Claims**

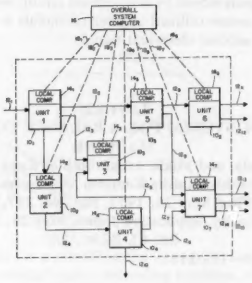


1. A control system for a balance correcting machine having a laterally advanceable cutter slide with a cutter mounted on a cutter spindle for machining a workpiece, comprising first means associated with the cutter slide for producing a first analog output signal when coming into contact with the to-be-machined surface of the workpiece as the cutter slide advances, said first analog output signal being indicative of the position of the cutter slide relative to said surface, second means for providing a second analog output signal indicative of the predetermined value of the unbalance of the workpiece prior to machining, third means for comparing the first analog output signal with the second analog output signal to produce a control signal, said third means including an amplifier for amplifying said first analog signal, an output voltage regulator for regulating the voltage of the amplified first analog signal, a firs A–D converter for converting the amplified first analog signal into a first digital signal, a first gate for selectively passing the first digital signal therethrough, a digital counter for presetting the first digital signal passed through said first gate, a second A–D converter for converting the second analog signal into a second digital signal, and a comparator for comparing said first digital signal of said first means preset in said digital counter with said second digital signal of said second means to produce a control signal and fourth means for controlling the cutter slide in accordance with the control signal to determine the proper correcting position of the cutter for machining said workpiece to the desired balance.

3,891,836
APPARATUS FOR OPTIMIZING MULTIUNIT PROCESSING SYSTEMS

Wooyoung Lee, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 246,445, April 21, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,620
Int. Cl. G06f *15/46;* **G06g** *7/58*
U.S. Cl. 235—151.12 **18 Claims**



1. Apparatus for controlling the operation of a processing system including a plurality of individual processing units supplied by a plurality of feed streams of materials being transformed by the units into a plurality of product streams flowing from the units, the product yield and the product cost or profit for each unit being dependent upon the operating conditions of the unit, said apparatus comprising:

feed stream computer means for generating initial feed stream signals representing the initial feed stream flow rates for a given yield and cost at each of the units under a given set of operating conditions so as to maximize the profitability of the overall system;

feed stream control means coupled to said feed stream computer means for controlling the feed stream flow rates in response to said initial feed stream signals;

unit yield and cost computer means for repeatedly and continuously generating new yield and cost signals representing new yields and costs at one of the units corresponding to an increase in the profitability of the overall system;

unit control means coupled to said unit yield and cost computer means for controlling the operating conditions at said one of said units in response to said new yield and cost signals; and

another feed stream computer means coupled to said unit yield and cost computer means for repeatedly and continuously generating new feed stream signals representing new feed stream flow rates in response to said new yield and cost signals;

said other feed stream computer means being coupled to said feed stream control means for controlling the feed stream flow rates in response to said new feed stream signals.

3,891,837
DIGITAL LINEARITY AND BIAS ERROR COMPENSATING BY ADDING AN EXTRA BIT

Drew E. Sunstein, 19 Parkhurst Dr., Nashua, N.H. 03060

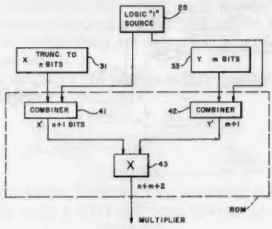
Filed July 3, 1972, Ser. No. 268,589
Int. Cl. G06f *7/38*
U.S. Cl. 235—152 **8 Claims**

1. Apparatus for bias error reduction in quantized number signals represented by first and second binary digits comprising,

a source of a first digital signal having N bits representing a quantity and having bias error,

a source of at least another digital signal,

means for representing said first digital signal as having N+1 bits with the least significant bit thereof always corresponding to the nonzero one of said two binary digits,



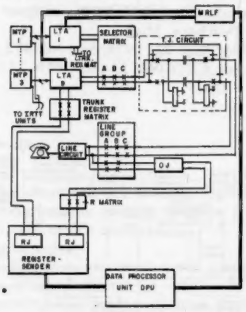
whereby this representation introduces an offset to reduce said bias error,

and means for combining the first digital signal represented as having N+1 bits by said means for representing with at least said another digital signal to produce a result signal with reduced bias error.

3,891,838
SYSTEM OF TESTING LINES OF A COMMUNICATION SWITCHING SYSTEM

Kurt F. Herr, Woodridge; Dennis A. Heck, Franklin Park; Lucian J. Lesny, Addison, and Ronald L. Ward, Palatine, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 15, 1973, Ser. No. 370,576
Int. Cl. H04m *3/26*
U.S. Cl. 235—153 AK **5 Claims**



1. In a communication switching system having switching network means for establishing connections between calling and called lines, register apparatus for receiving call processing information from a calling line via said switching network means, a pool of register junctors coupling said switching network means and the register apparatus for serving as inlets therefor through which are conveyed said information, a data processor means coupled to said register apparatus for performing testing operations on the system, a line testing arrangement comprising:

manual testing means for initiating tests of a selected line to be tested;

line testing adapting means coupled between said manual testing means and said switching network means and

responsive to an initiation signal from said manual testing means for causing the establishment of a first connection to an idle one of the register junctors so that call processing information indicative of the selected line can be supplied from said testing means to the register apparatus for establishing a second connection to the selected line from said manual testing means which can then test said selected line; and

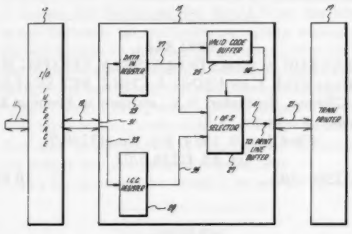
logic means responsive to an in-test signal from said manual testing means for generating an interrupt signal and for supplying it to said processor means to request it to cause said switching network means to establish a third connection between said selected line to another one of said register junctors while maintaining said second connection between said adapting means and said selected line so that said manual testing means can perform in-testing operations.

3,891,839

METHOD AND APPARATUS FOR IDENTIFYING AN INVALID CHARACTER CODE

Randall G. Ehlers, San Jose, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 22, 1974, Ser. No. 490,563
Int. Cl.[2] G06K *5/02*; **B41B** *25/24*
U.S. Cl. 235—153 AS **3 Claims**



2. A method for verifying that a received character code to be read into a print line buffer identifies a character within a previously defined character set, the method comprising:

clearing all storage locations in a read/write memory to a first predetermined logical signal representation;

writing a second predetermined logical signal representation into each storage location in a read/write memory having an address corresponding to a character code of the defined character set;

storing a character code that represents an invalid character in the defined character set;

addressing the read/write memory with each received character code that is intended to be read into said print line buffer; and

selecting either the received character code or the invalid character code to be read into said print line buffer, depending on the logic level read out of the read/write memory.

3,891,840

LOW LEAKAGE CURRENT INTEGRATOR

Robert L. Cloke, Santa Clara, Calif., assignor to Information Storage Systems, Inc., Cupertino, Calif.

Filed Dec. 14, 1973, Ser. No. 424,841
Int. Cl. G06g *7/18*
U.S. Cl. 235—183 **1 Claim**

1. A current integrator capable of performing the function $1/c \int I\,dt$, said integrator comprising:

first and second integrator input terminals and first and second integrator output terminals;

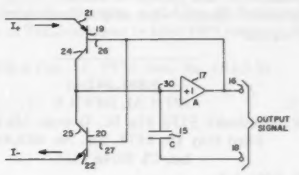
a capacitor having first and second terminals;

first and second transistors with the collectors thereof interconnected with the first terminal of the capacitor;

an isolation amplifier having a gain of unity and having input and output terminals;

circuit means connecting the first terminal of the capacitor to the amplifier input terminal;

circuit means connecting the bases of the first and second transistors, the output of the amplifier and the first integrator output terminal;



circuit means connecting the capacitor second terminal with the second integrator output terminal;

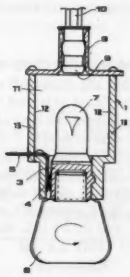
circuit means connecting the first and second integrator input terminals to the first and second transistor collectors respectively whereby electric current transmitted to the integrator input terminals will result in a voltage signal at the integrator output terminals which is the integral of the differences in the current received at the integrator input terminals.

3,891,841

DEVICE FOR CONTINUOUSLY REGULATING THE INTENSITY OF THE LUMINOUS FLOW PROJECTED TOWARDS THE RADIANT ENERGY CARRIERS

Giuseppe Codrino, Via Stazione, 15028 Quattordio (Alessandria), Italy

Filed Feb. 6, 1974, Ser. No. 440,041
Claims priority, application Italy, Mar. 1, 1973, 210/73
Int. Cl. F21
U.S. Cl. 240—1 LP **10 Claims**



1. An apparatus for continuously regulating luminous intensity, particularly for use in variable lighting of the instrument panels of motor vehicles or the like, comprising a first element formed with a recess bounded by an inner peripheral wall surface and having two open ends and a longitudinally spaced wall portion, said first element including securing means and abutment means; a second element receivable with clearance in said recess through one of said open ends and overlying a portion of said inner peripheral wall surface; a radiant energy source accommodated in said second element and projecting said radiant energy onto said inner peripheral wall surface when said second element is received in said recess; a bundle

of radiant energy carriers receiving said radiant energy and conducting said radiant energy away from said first element; a third element receivable with clearance in said recess through the other of said open ends of said first element and being fixedly mounted therein so as to fixedly mount said bundle of radiant energy carriers in said other open end; and movement means for continuously varying the axial position of said radiant energy source with respect to the fixed position of said bundle of radiant energy carriers, said movement means being limited by said abutment means so as to limit said axial movement of said radiant energy source towards said fixed position of said bundle of radiant energy carriers to a predetermined distance when said second element is received in said recess.

3,891,842

OPTICAL DEVICE

Mary R. Strusinski, 5132 31st St., Detroit, Mich. 48210

Filed May 10, 1974, Ser. No. 468,918

Int. Cl. H04n *7/18*

U.S. Cl. 240—1.4 **5 Claims**

1. In apparatus for illuminating and simultaneously optically reproducing a surgical subject in a surgically sterile field, the improvements comprising:

a lamp operable to illuminate surfaces at a relatively high light intensity;

means supporting said lamp;

means gimballing said lamp on said supporting means whereby said lamp is operable to pivot and rotate with respect to said supporting means through a substantial displacement on a spherical surface corresponding to said gimballing means;

a directing member;

means rigidly securing said directing member to said lamp in a manner such that the upper aft portion of said member is proximate the focal axis and optical center of the outer surface of the outermost lens of said lamp at a point forward and below said center;

and a camera rigidly mounted on said member in such a manner that the focal axis of the outermost lens of said camera is substantially co-linear with the focal axis of the outermost lens of said lamp.

3,891,843

PHOTOSENSITIVE TRACKER INCLUDING MEANS FOR PRODUCING AN OUTPUT IN ACCORDANCE WITH A PLURALITY OF RADIATION CHARACTERISTICS

William J. Parkin, Natick, Mass., assignor to Sanders Associates, Inc., South Nashua, N.H.

Filed Apr. 5, 1963, Ser. No. 272,181

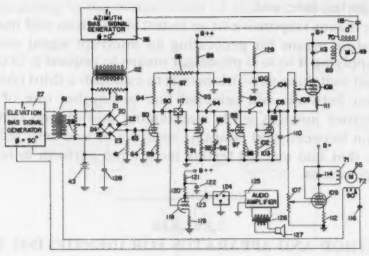
Int. Cl. G01j *1/20*

U.S. Cl. 250—203 R **26 Claims**

16. Sensing apparatus, comprising:

radiation responsive, variable impedance detector means having an element adapted to vary in impedance in response to said radiation for continuously producing a position signal indicative of the position of said radiation relative to said element and in accordance with the variation of an internal element impedance with respect to another internal element impedance;

load impedance means coupled to said detector means for continuously developing an intensity signal, independently of said position signal, in accordance with the



variation of the total impedance of said element with respect to said load impedance and indicative of the intensity of said radiation; and

output means coupled to said detector and load means for providing an output signal in accordance with selected characteristics of said radiation.

3,891,844

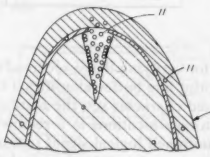
PROCESS FOR NONDESTRUCTIVELY TESTING WITH RADIOACTIVE GAS USING A CHILL SET SEALANT

Carl B. Gibbons, Rochester, N.Y., assignor to Eastman Kodak Company, Roc[illegible]ter, N.Y.

Filed [illegible]tan. 9, 1974, Ser. No. 432,019

Int. Cl. G21h *5/02*

U.S. Cl. 25[illegible] **10 Claims**



1. In a method of nondestructively testing an article surface for substantially invisible voids comprising

a. adsorbing a radioactive gas on the surface of the article by bringing it into contact with the gas,

b. disproportionately retaining the adsorbed radioactive gas on those surfaces presented by the substantially invisible voids as compared to the remaining surfaces of the article contacted by the radioactive gas, and

c. utilizing radiation released by the radio-active gas remaining adsorbed to identify the substantially invisible voids,

the improvement comprising

1. providing a sealant composition capable of being chill set,

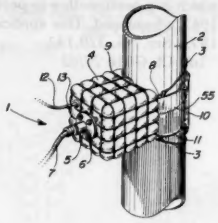
2. relating the temperatures of the article surface to be tested and the sealant composition so that the article surface to be tested is at a temperature below the chill set temperature of the sealant composition and the sealant composition is at a temperature above its chill set temperature, and

3. coating the article portion to be tested with sealant composition to form a chill set coating thereon of substantially uniform thickness.

3,891,845
WET ENVIRONMENT RADIOGRAPHY APPARATUS

Paul Nelson English, 2741 Iowa St., Baton Rouge, La. 70802

Filed Dec. 18, 1972, Ser. No. 315,914
Int. Cl. G03b *41/16*
U.S. Cl. 250—321 **5 Claims**

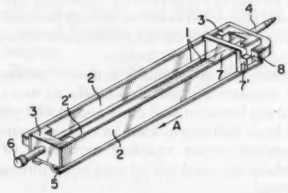


1. In an apparatus for making a radiograph of an object submerged in a liquid, the improvement therein which comprises the combination of:
a. means for providing a beam of penetrating radiation;
b. means for supporting the radiation-providing means;
c. means for securely positioning the means for supporting the radiation-providing means in proximity to, but spaced from the object to be radiographed, so the radiation will impinge upon a chosen section of a surface of the object;
d. means for displacing the liquid from the intervening space between the radiation-providing means and said chosen section so that significant attenuation and scattering of the beam of radiation impinging upon said chosen section will not result, the radiation-providing means and support means being otherwise surrounded by the liquid;
e. imaging means positioned on a surface of the object so that said chosen section is between the radiation-providing means and the imaging means; and
f. means for securing the imaging means to the object.

3,891,846
CORONA DISCHARGER CLEANING APPARATUS

Yoshio Ito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 322,228, Jan. 9, 1973, abandoned.
This application May 30, 1974, Ser. No. 474,789
Claims priority, application Japan, Jan. 18, 1972, 47-7024
Int. Cl. H01j *37/26*
U.S. Cl. 250—324 **16 Claims**

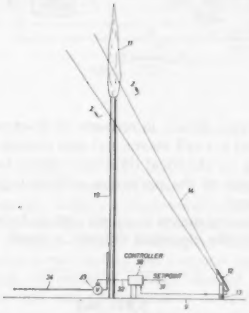


1. A corona discharger comprising:
corona discharge electrodes;
a shield member surrounding said corona discharge electrodes and at least having a discharging slit;
support members provided at the opposite ends of said shield member;
a member for connecting said corona discharge electrodes with a source of high voltage;
a cleaning member movable in frictional contact at least with said corona discharge electrodes to thereby clean the same;
means for holding said cleaning member at one end of said corona discharger during non-cleaning; and
means for reciprocating said cleaning member between the opposite ends of and along said corona discharge electrodes responsive to movement of a detachable element for a copying device.

3,891,847
METHOD AND APPARATUS FOR CONTROLLING THE ADDITION OF A COMBUSTION ASSISTING FLUID TO A FLARE

Thomas R. Schmidt, Houston, and Gary B. Schinman, Deer Park, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 13, 1974, Ser. No. 442,030
Int. Cl. G01j *5/00*
U.S. Cl. 250—342 **10 Claims**



1. A method for controlling steam flow to a flare stack for improving combustion comprising:
detecting the radiation existing at the base of the flare while substantially discriminating against reflected light;
producing a signal proportional to said detected radiation; and
controlling the steam flow in response to said signal.

3,891,848
FLUORESCENCE DETECTOR FOR MONITORING ATMOSPHERIC POLLUTANTS

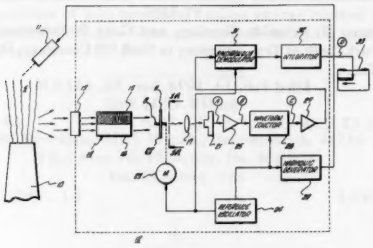
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert R. Menzies, Pasadena, Calif.

Filed Dec. 27, 1973, Ser. No. 428,993
Int. Cl. G01t *1/16*
U.S. Cl. 250—345 **12 Claims**

1. A remote measuring device for monitoring pollutant gases in an atmospheric area including the subject pollutant gases, which area is located at a site remote from the measuring device, said measuring device comprising:
an infrared coherent radiation source adapted to excite fluorescence radiation in said pollutant gases at said atmospheric area;
filter means at said measuring device for blocking infrared radiation from said coherent radiation source and passing said fluorescence radiation from the excited pollutant gases;
a gas cell means in the path of said fluorescence radiation passed by said filter means, said gas cell means containing a standard sample of a known pollutant gas to be moni-

tored for absorbing the fluorescence associated with said known gas and passing the remaining fluorescence;

a neutral cell means in the path of said fluorescence radiation passed by said filter means for passing all of said fluorescence including the fluorescence of the type absorbed by said gas cell means;



photodetector means, in response to fluorescence received from said gas cell means and said neutral cell means, for emitting an electrical difference signal indicative of the magnitude of the particular pollutant gas being monitored; and

signal detecting means in circuit with said photodetector for detecting the electrical difference signal.

3,891,849

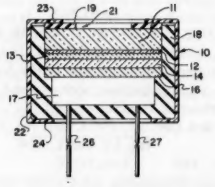
MEANS FOR INTEGRATING ERYTHEMAL SPECTRAL RADIATION

Patrick E. Felice, Jeannette, and Robert R. Ferber, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1974, Ser. No. 438,060

Int. Cl. G01j *1/02*

U.S. Cl. 250—372 **14 Claims**



1. An erythemal radiation sensing means comprising an interference filter consisting essentially of a thin film having a vacuum deposition on one side adapted to transmit ultraviolet radiation of from 2800 to 3200 A, a magnesium tungstate phosphor coating on said other side of said interference filter thin film, a photocell having an active surface positioned substantially against said phosphor coating, and an elastomeric member for encapsulating said filter and photocell and including a window at one end to expose said thin film filter.

3,891,850

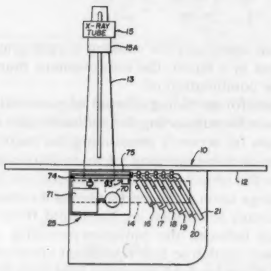
X-RAY TABLE

Cecil K. Bridgeman, Islington, Canada, assignor to Picker X-Ray Mfg. Limited, Bramalea, Canada

Continuation of Ser. No. 93,268, Nov. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 777,943, Oct. 4, 1968, abandoned, which is a continuation-in-part of Ser. No. 657,121, July 31, 1967, abandoned. This application Jan. 2, 1973, Ser. No. 320,142

Int. Cl. G01n *23/02*

U.S. Cl. 250—444 **44 Claims**



1. In a film handling system for a medical X-ray examination mechanism including an X-ray tube and a patient engaging surface connected to a body, the combination of:

a. the body defining an unexposed film magazine, an exposed film receiving means, an exposure station, and film transport means for conveying film from said unexposed film magazine to said exposure station for exposure and thereafter to said exposed film receiving means;

b. said unexposed film magazine comprising a plurality of drawer members having film receiving volumes and closure members supported by respective drawer members for movement between an opened position and a closed position and wherein said respective drawer member is closed in a light tight fashion;

c. actuator means including actuator members associated with respective closure members to move said closure members between said open and closed positions;

d. said body defining at least an access opening and drawer supporting means enabling movement of said drawer members into and out of said body through said access opening;

e. an access door supported by said body for movement between a closed position wherein said access opening is closed against entrance of light into said body and an open position wherein drawer members of said magazine are removable;

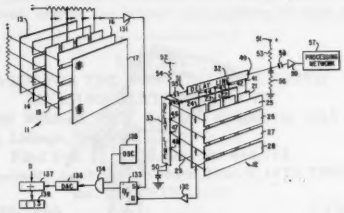
f. door locking means preventing movement of said access door to said position when said closure members are away from said closed positions whereby film in said magazine cannot be inadvertently exposed by opening said access door when the closure members are in their open positions; and,

g. said body including structure shielding unexposed film in said magazine from radiation when said tube is energized.

3,891,851
IMPACT POSITION DETECTOR FOR OUTER SPACE PARTICLES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Siegfried O. Auer, Lanham, Md.

Filed Aug. 30, 1974, Ser. No. 502,136
Int. Cl. G01t 1/00
U.S. Cl. 250—385 13 Claims



1. In an apparatus for determining the impact position of cosmic dust or other similar outer space particles on a detector, an array of electrically conducting, mutually insulated metal strips each having a different impact area for the particles, each of said strips including means for generating a different electric pulse in response to a particle having a line of flight in the impact area thereof, the strips of said array being arranged so that each strip uniquely indicates the spatial location of an impact, at least some of said strips having parallel longitudinal axes and defining an impact area having the same length in a direction at right angles to the longitudinal axes, a delay line having a multiplicity of taps, each of which is connected to one of said strips, the delay time of the delay line between adjacent taps being proportional to the spatial separation between adjacent electrodes, whereby a first pulse is induced in the delay line at the tap connected to the strip in which a line of flight exists and propagates down the delay line to a first end thereof, means for substantially preventing reflection of pulses from the first end of the line, and an amplifier having an input terminal connected to be responsive to pulses arriving at the first end of the line.

3,891,852
NEUTRON DETECTION AND RADIOGRAPHY

Romain Henri Bollen, Hove, and Robert Florent Van Esch, Mechelen, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

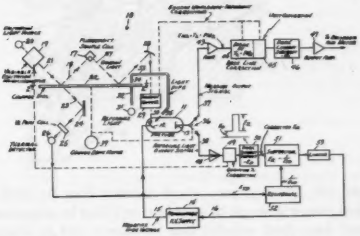
Filed Nov. 3, 1972, Ser. No. 303,387
Int. Cl. G01t 3/00
U.S. Cl. 250—391 29 Claims

1. A method of recording neutron images which method comprises the steps of (1) information-wise irradiating with neutrons an intensifying screen incorporating a phosphor compound in which gadolinium is the host metal and at least one other rare earth metal is present as a fluorescence activating metal; and (2) subjecting the fluorescent light pattern resulting from the impact of the neutrons on the screen onto a photographic material.

3,891,853
ENERGY COMPENSATED SPECTROFLUOROMETER

Jerome C. Kremen, Takoma Park, and Isaac Landa, Wheaton, both of Md., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Mar. 20, 1974, Ser. No. 452,980
Int. Cl. G01n 21/52
U.S. Cl. 250—458 14 Claims



1. In a spectrofluorometer, a source of radiant energy, a transparent sample holder, a photosensitive detector having variable gain, a moving chopper element, means including said moving chopper element defining an excitation optical channel directed to said holder and a second optical channel, means defining an emission optical channel between said sample holder and said photosensitive detector, a measure signal channel and a reference signal channel, switch means synchronized with the chopper element to alternately connect the output of the photosensitive detector to the measure signal channel and the reference signal channel, a reference radiant energy source, means including said moving chopper element defining an optical path between said reference source and said photosensitive detector time-shared with said emission optical channel, and means controlling the gain of said photosensitive detector in accordance with the signal generated in said photosensitive detector by said reference radiant energy source and the energy content of said second optical channel.

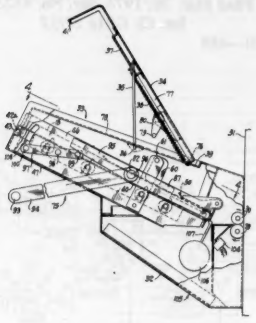
3,891,854
METHOD AND APPARATUS FOR UNLOADING CASSETTES

Michael Hura, Wickliffe, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed Dec. 4, 1969, Ser. No. 882,084
Int. Cl. G01n 23/04
U.S. Cl. 250—468 16 Claims

1. A daylight cassette unloader comprising:
a. a housing including a load opening and means to render the load opening light tight;
b. said housing defining a light-tight enclosure at times when cassettes are opened therein;
c. cassette retainer release means within the housing and adapted to release cassette retainers upon insertion of a cassette into the housing and thereafter to maintain the cassette in a closed condition.
d. cassette opening means at least partially within the housing and adapted to open a cassette and release a film retained therein after operation of the retainer release means and subsequent to the load opening being rendered light tight by the rendering means; and,
e. said opening means being adapted to permit a back plate

of the cassette to swing open and the lead edge of a sheet of film to drop while a portion near the trailing edge is pinched to retain it in the cassette and thereafter to release the pinch on the trailing portion.



3,891,855

HIGH ENERGY ELECTRON IRRADIATION OF FLOWABLE MATERIALS

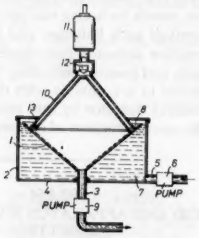
Bernd Peter Offermann, Hamburg, Germany, assignor to Licentia-Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Nov. 28, 1973, Ser. No. 419,543

Claims priority, application Germany, Nov. 29, 1972, 2258393

Int. Cl. H01j *37/06*

U.S. Cl. 250—492 **2 Claims**



1. Apparatus for irradiating a flowable material with high energy electrons, comprising, in combination: a container for holding a quantity of such material; a funnel-shaped hollow body disposed in said container with the small diameter opening of said body directed downwardly and the upper extremity of said body at a lower elevation than the top of said container; outlet conduit means connected to the small diameter opening of said body for receiving material from the region enclosed by said body, said conduit passing through the bottom of said container in a liquid-tight manner; inlet conduit means connecting the interior of said container with a source of material to be irradiated; material delivery means connected in said inlet conduit means for delivering such material to the interior of said container at a predetermined rate selected for causing material filling said container to overflow the upper extremity of said body and to flow down the inner wall surface of said body as a continuous, uniform stream; and irradiation means disposed for irradiating such material with high energy electrons as the material flows down said inner wall surface of said body.

3,891,856

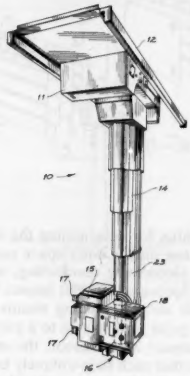
MOUNT FOR CEILING SUPPORTED X-RAY TUBE

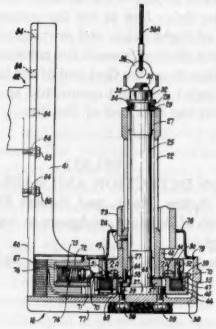
William H. Amor, Jr., Auburn Township, and Robert E. Stancliff, Mentor, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed Nov. 21, 1973, Ser. No. 418,057

Int. Cl. H05g *1/02*

U.S. Cl. 250—523 **21 Claims**





1. X-ray apparatus comprising:
a. supporting and supported members;
b. bearing mechanism interposed between the members to permit relative rotation of the members;
c. an X-ray tube carried by one of the members;
d. tube supporting structure connected to the other of the members for supporting the members and the tube;
e. a rotation control element rotatably positioned between the members and coactable with the members to provide relative rotation of a predetermined maximum amount;
f. a selected one of the element and the supporting member having a first recess formed therein and defined in part by a pair of arcuately spaced stop surfaces, said surfaces

being coactable with a projection extending from the other of the element and the supporting member;

g. a selected one of the element and the supported member having a second recess formed therein and defined in part by another pair of arcuately spaced stop surfaces, said other surfaces being coactable with another projection extending from the other of the element and the support member; and,

h. the members being at one limit of relative rotation when said projections are respectively in engagement with a first one of each pair of stop surfaces and being at the other limit of relative rotation when the projections respectively engage the second stop surfaces of each pair.

3,891,857

DEVICE FOR THE NON-CONTACT LENGTH MEASUREMENT OF OBJECTS

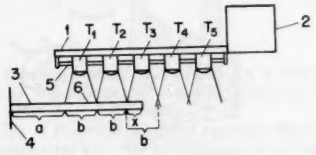
Klas Rudolf Wiklund, Taby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Feb. 22, 1974, Ser. No. 444,712

Claims priority, application Sweden, Mar. 9, 1973, 7303302

Int. Cl.[2] G01N *21/30*

U.S. Cl. 250—560 **5 Claims**



1. A device for measuring the length of an object including: a plurality of radiation sensors mounted to divide the length which is to be measured into a corresponding number of length increments, each of said sensors providing a first signal level when no radiation is incident thereon and a second signal level when more than a predetermined amount of radiation is incident thereon and a signal between said first and second signals level for radiation below said predetermined level; and means for combining signals from said plurality of sensors to provide a measurement of the length of said object; the device being characterized in that the area from which each of the sensors receives radiation is arranged so that by means of an optical element inserted in each sensor, the ray path is restricted to a substantially rectangular shape; said device being further characterized in that the said optical elements consist of a cylindrical lens whose generatrices of the cylinder surface are parallel with the length being measured.

3,891,858

OPTICAL-ELECTRONIC SEMICONDUCTOR COUPLING ELEMENT

Werner Schoberl, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Nov. 1, 1973, Ser. No. 411,732

Claims priority, application Germany, Nov. 2, 1972, 2253699

Int. Cl. G02f *1/28*

U.S. Cl. 250—551 **7 Claims**

1. An optical-electronic semiconductor coupling element, comprising:

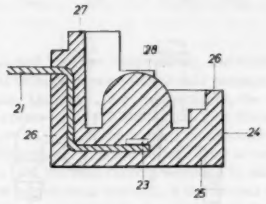
a. a light-emitting semiconductor component;

b. a light-sensitive semiconductor component;

c. first light-permeable housing means, made of plastic, within which said light-emitting component is embedded, said first housing means having a lens-shaped part through which light emittered by said light-emitting component may exit;

d. second light-permeable housing means, made of plastic, within which said light-sensitive component is embedded, said second housing means having a lens-shaped part through which light that is to impinge on said light-sensitive component may enter; and

e. third, outer housing means, made of plastic, surrounding at least part of said first and second housing means, said third housing means comprising a tubular body and said first and second housing means being arranged at opposite ends of said tubular body, respectively, the lens-shaped parts of said first and second housing means being generally in the center of said tubular body and being positioned with their respective lens-shaped parts directed toward each other, said lens-shaped parts having front faces which form between themselves a gap of approximately 0.1 mm.



3,891,859

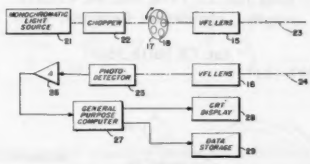
PULSED, VARIABLE BEAM PATTERN OPTICAL MEASURING DEVICE

Clarence J. Funk, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1974, Ser. No. 481,589

Int. Cl.[2] G01N *21/28*

U.S. Cl. 250—564 **21 Claims**



12. A method of measuring optical properties of a body of fluid comprising in sequence the steps of:

generating a beam of quasi-monochromatic light energy;

directing said beam of quasi-monochromatic energy into said body of fluid in a predetermined angular divergence;

pulsing said beam of quasi-monochromatic light into a plurality of time separated pulses;

receiving the pulsed light returned from said body of fluid;

converting said received pulsed light into electrical analogs thereof;

sensing the electrical analogs of the pulsed light analog signals at predetermined time intervals between pulses;

repeating said previous five steps for other predetermined angular divergences;

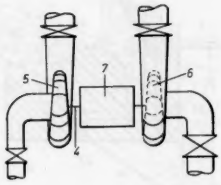
measuring the exponential decay rate of the power of the returned pulses; converting the measured data to the basic optical properties of said body of fluid; and

storing said calculated data for further analysis.

3,891,860
PUMPED STORAGE POWER PLANT

Georg Hutarew, Stuttgart-Schoenberg, Germany, assignor to J. M. Voith GmbH, Heidenheim (Brenz), Germany

Filed Mar. 11, 1974, Ser. No. 450,222
Claims priority, application Germany, Mar. 16, 1973, 2313095
Int. Cl. F03b 3/10
U.S. Cl. 290—52 X 7 Claims

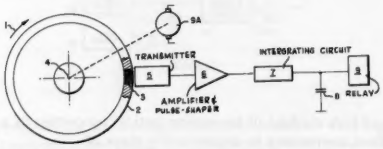


1. Pumped-storage plant comprising a pump turbine, an electric motor-generator coupled with said pump turbine, an additional pump also coupled with said motor-generator, and means for admitting operating medium separately to said pump turbine and said additional pump, said additional pump having a construction for pumping only in an upper delivery head subrange ranging upwardly to maximum delivery head, and said pump turbine having a construction so that, when operating as a pump, it pumps only in a lower delivery head subrange ranging downwardly to minimum delivery head, both of said subranges being at least mutually adjacent, said pump turbine being further constructed so that, when operating as a turbine, it operates within the entire fall head range.

3,891,861
DEVICE FOR MONITORING THE TEMPERATURE OF ROTATING MACHINE PARTS

Karl-Heinz Weber, Witten-Heven, and Anton Dinkelbach, Gelsenkirchen, both of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesseri m.b.H., Bochum, Germany

Filed Jan. 23, 1974, Ser. No. 435,878
Claims priority, application Germany, Feb. 3, 1973, 2305388
Int. Cl. H01h 36/00
U.S. Cl. 307—117 6 Claims



1. Apparatus for monitoring the temperature of a rotatable element during rotation without contact therewith, said apparatus comprising:

magnetic flow means including a ferromagnetic insert carried by said rotatable element for rotary movement therewith, said ferromagnetic insert having a Curie point temperature at which said insert becomes paramagnetic;

an inductive pulse transmitter forming an air gap with said ferromagnetic insert for producing electrical pulses in response to the passing movement of said insert relative to said transmitter;

means for shaping and amplifying the successive pulses produced by said transmitter;

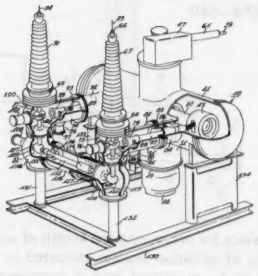
means including an integrating circuit receiving the shaped and amplified pulses for producing a continuous control signal to indicate that the temperature of said insert lies below the Curie point temperature of the insert; and

means responsive to said control signal for controlling rotation of said rotatable element in a dependent relation upon said ferromagnetic insert attaining a temperature which is not in excess of the Curie point temperature of said ferromagnetic insert.

3,891,862
COMPACT UNIT BREAKER

Thomas F. Clark, Canton, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 26, 1973, Ser. No. 373,789
Int. Cl.[2] H01H 47/00
U.S. Cl. 307—125 5 Claims



1. In a compact single phase power circuit breaker assembly comprising a plurality of operative gas sealed units including; a portable supporting base;

an upstanding U-shaped enclosure mounted on said base for movement with said base, said U-shaped enclosure including an assembly of gas sealed housings in which electrical operating components are disposed;

a gas sealed interrupter tank supported on said base for movement with the base and extending parallel to said U-shaped enclosure, said tank operatively supporting at least one circuit interrupter therein;

a horizontal gas sealed housing interconnecting a gas sealed housing of each upstanding leg of said U-shaped enclosure with an adjacent end of said interrupter tank, the horizontal gas sealed housings being disposed in parallel spaced apart relationship in the same horizontal plane;

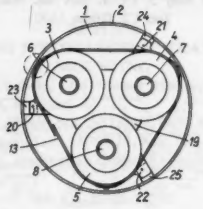
an electrical circuit interrupter disconnect switch in a gas sealed housing of each leg of said U-shaped enclosure to which said interrupter tank interconnecting housings are connected, the disconnect switch of each leg being operable to interrupt the circuit through the horizontal parallel interconnecting housing for isolating each side of the circuit interrupter; and,

a bypass disconnect switch in a gas sealed housing of at least one of said legs of said U-shaped enclosure and operable to establish a bypass circuit from the circuit interrupter disconnect switch of the associated leg of the U-shaped enclosure through the base of the U-shaped enclosure and through the circuit interrupter disconnect switch in the sealed housing of the other leg of said U-shaped enclosure.

3,891,863
VOLTAGE TRANSFORMER FOR A FLUID INSULATED HIGH-VOLTAGE MULTI-CONDUCTOR SWITCHING APPARATUS

Gerhard Kleen, and Albert Herrmann, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1974, Ser. No. 470,906
Claims priority, application Germany, May 17, 1973, 2325446
Int. Cl. H01f *40/08, 40/10;* **H01b** *9/06*
U.S. Cl. 307—147 **15 Claims**



1. An improved voltage transformer for a fluid insulated high-voltage multi-conductor switching apparatus, which includes a metal casing, comprising:

a plurality of electrical insulation members disposed about the conductors and each having an electrode disposed on the surface thereof;

a centering member, disposed between said insulation members and in engagement therewith, for positioning said members in a predetermined position relative to the conductors;

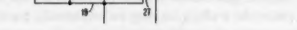
means, disposed about said electrical insulation members and said centering member, for securing said members in said predetermined position relative to said conductors; and

means for fastening said electrical insulation members secured in said predetermined position to said metal casing.

3,891,864
JOSEPHSON JUNCTION LOGIC ELEMENT

Pierre Leopold Gueret, Thalwil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1973, Ser. No. 412,084
Claims priority, application Switzerland, Nov. 17, 1972, 16755/72
Int. Cl. H03k *19/02, 3/38*
U.S. Cl. 307—212 **5 Claims**



1. A Josephson junction logic circuit comprising an output circuit having at least a single resettable Josephson device connected to a transmission line which is terminated with its characteristic impedance and having an input circuit coupled to said device, said output circuit having parameters which meet the following criteria:

$$\frac{I_{min}}{i_{mo}} \simeq \frac{G}{G_o}\frac{i_m/i_{mo}}{\beta_c} + \frac{(\pi/4)^2}{2\beta_c}\frac{i_m^2}{i_{mo}}$$

$$\frac{4}{\pi}\frac{V_{min}}{V_g} \simeq \frac{i_m/i_{mo}^{1/2}}{\beta_c}$$

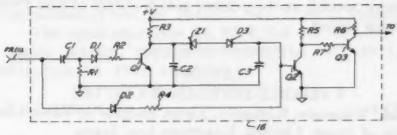
$$\frac{I_b}{i_{mo}} < \frac{(\pi/4)^2}{2\beta_c} + \frac{1+GR_L}{G_oR_L}\frac{1}{\sqrt{\beta_c}}$$

wherein I_{min} and V_{min} are, respectively, the minimum junction current and voltage beyond which said junction reverts to its voltage state, I_{mo} and i_m are, respectively, the maximum Josephson currents for $I_c = 0$ and I_c 0, G is the actual conductance at $V_j = V_{min}$, G_o is the normal conductance for $V_j > V_g$, V_g is the gap voltage, V_j is the voltage drop across said Josephson device, I_b is the bias current supplied to said junction, β_c the junction admittance ratio, R_L is the output resistance and I_c is the control current applied to said input circuit, said input circuit including at least a single reversible Josephson device therein and at least a single signal means electrically coupled to said at least a single reversible Josephson device and at least an inductance electrically connected to said at least a single reversible Josephson device, said inductance having a value that, at least in the fundamental mode, where N = 0, only less than one flux quantum can be trapped by said inductance and wherein $I_{bo}/i_{mo} < \pi/\lambda$ where I_{bo} is the bias current supplied to said reversible device, λ is proportional to the inductance L and, N is the maximum number of flux quanta, ϕ_o, which can be trapped in the inductance.

3,891,865
INTRUSION DETECTOR

Salvatore R. Picard, Hatboro, and Robert F. Starry, Horsham, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 14, 1973, Ser. No. 415,900
Int. Cl. H03k *5/18*
U.S. Cl. 307—232 **3 Claims**



1. A low current counting device for indicating the receipt of at least two pulses within a predetermined period of time, comprising, in combination:

first switching means including a first transistor having a base operatively connected to receive individual ones of said pulses, an emitter connected to ground, and a collector, and timing means having one terminal of a resistor, the cathode of a zener diode and one terminal of a first capactitor commonly connected to said collector, one terminal of a second capacitor operatively connected to the anode of said zener diode for providing an output signal for said predetermined period of time whereby said output signal is indicative of the end of the first one of said pulses, the other resistor terminal being connected to a voltage supply and the other first and second capacitor terminals being connected to ground;

second switching means having an input commonly connected to receive said first switching means output signal and said pulses for switching to a nonconductive state in response to the second one of said pulses within said first switching means predetermined period of time, and an output for providing a signal indicative thereof; and

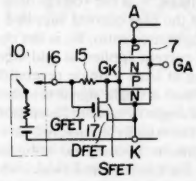
third switching means having an input connected to receive said second switching means output signal for switching to a conductive state in response to said second switching means output signal, and an output for providing said counting device output signal.

3,891,866

HIGHLY SENSITIVE GATE-CONTROLLED PNPN SWITCHING CIRCUIT

Shinzi Okuhara, Fujisawa; Masaaki Kusano, and Mitsuru Kawanami, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 28, 1974, Ser. No. 484,238
Claims priority, application Japan, July 2, 1973, 48-73725
Int. Cl. H03k *17/16, 17/72*
U.S. Cl. 307—252 A **8 Claims**



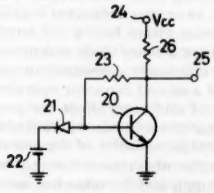
1. A highly sensitive gate-controlled PNPN switching circuit comprising a PNPN switch having a structure equivalent to a four-layer one consisting of P, N, P and N conductivity type layers; a field effect transistor and a voltage drop element, wherein electrodes are provided on the first (P) layer, the third (P) layer and the fourth (N) layer, the source and the drain of said field effect transistor are connected respectively with said third (P) and said fourth (N) layers of said PNPN switch, one end of said voltage drop element is connected with said third (P) layer of said PNPN switch, and the other end of said voltage drop element is connected with the gate of said field effect transistor, the junction point of said other end of said voltage drop element and said gate of said field effect transistor serving as the control gate terminal of said PNPN switching circuit.

3,891,867

VARIABLE IMPEDANCE CIRCUIT

Yasuaki Watanabe, Kasugabe, Japan, assignor to Victor Company of Japan, Limited, Kanagawa-ken, Japan

Filed Oct. 25, 1973, Ser. No. 409,443
Claims priority, application Japan, Oct. 31, 1972, 47-109352; Oct. 31, 1972, 47-109353; Dec. 28, 1972, 48-3461
Int. Cl. H03k *1/14;* **H03g** *3/00*
U.S. Cl. 307—264 **6 Claims**



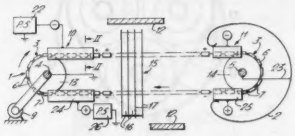
1. A variable impedance circuit comprising: a transistor having a grounded emitter, and a collector connected to a power source through a load resistor; a first resistor connected between the collector and the base of said transistor; a diode connected to said base of the transistor with a polarity opposite that of an equivalent diode between said base and emitter of the transistor, the semi-conductor material of said diode being the same as that of said transistor; and a variable voltage source for control connected serially through said diode to said base of said transistor and operating to vary voltage, the impedance between the collector of the transistor and ground being varied linearly according to the value of the voltage of said variable voltage source.

3,891,868

ELECTRICALLY-CONDUCTING MATERIALS

Norman George Joyce, Reading, England, assignor to Science Research Council, London, England

Filed May 3, 1974, Ser. No. 466,846
Int. Cl. H02n *1/00*
U.S. Cl. 310—5 **9 Claims**



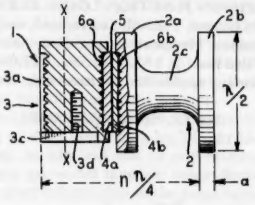
1. For use in an electrostatic generator of the kind in which an electrode is charged to a high electrical potential by the transfer of electrical charges there to by an endless charge conveyor, an electrically conductive pulley for the charge conveyor, the pulley comprising a metal hub portion and a rim portion, the rim portion having a conveyor-engaging surface at least in part formed by the edges of laminations of sheets of electrically conductive fibres integrated into a coherent body by a cured impregnant.

3,891,869

PIEZOELECTRICALLY DRIVEN ULTRASONIC GENERATOR

Thomas J. Scarpa, Edison, N.J., assignor to Scarpa Laboratories, Inc., Metuchen, N.J.

Filed Sept. 4, 1973, Ser. No. 394,407
Int. Cl. H04r *17/00*
U.S. Cl. 310—8.2 **8 Claims**



1. A transducer assembly comprising in combination:
an ultrasonic generator which includes a pair of piezoelectric ceramic wafers having substantially parallel opposite major surfaces comprising electrode means interposed between the internal major surfaces of said wafers and on the two external surfaces thereof, said generator designed to vibrate in the direction of the longitudinal axis of said transducer assembly in a principal resonant-thickness mode of vibration.
a cylindrical backing element having a pair of substantially flat end surfaces,
means interposed between one said end surface of said cylindrical backing element and one of the opposite sur-

faces of said generator for bonding said backing element to said one face,

a solid transforming member formed to include at its opposite ends a pair of substantially circular parallel disks coaxial with said ultrasonic generator each having a diameter slightly exceeding the diameter of said generator, said disks spaced apart along the axis thereof by a connecting portion symmetrical about the said axis and declining therebetween to a minimum diameter not exceeding about one-third the diameter of said disks,

one of said disks being bonded in acoustical transfer relation to the other face of said generator, and the other said disk being free to function as an ultrasonic radiator.

3,891,870
ROTATING PIEZOELECTRIC TRANSDUCER MOUNTING

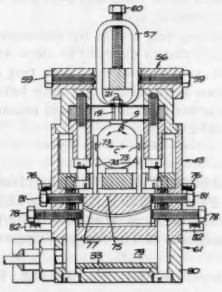
James Patrick Corbett, Old Manor House, 27 Station Rd., Thames Ditton, England

Continuation of Ser. No. 302,098, Oct. 30, 1972. This application Mar. 15, 1974, Ser. No. 451,457

Claims priority, application United Kingdom, Nov. 23, 1971, 54410/71

Int. Cl. H04r *17/00*

U.S. Cl. 310—8.7 **17 Claims**



1. A force transducer comprising:

an enclosure including a frame and a base;

a plate-like piezo electric crystal mounted in said enclosure upright with respect to said base;

means for mounting said crystal in position and for permitting rotation of said crystal in its own plane, said means for mounting comprising a seat on said base, and a spigot for transmitting a force to be measured to said crystal, said base and said spigot engaging opposite edge portions of said crystal, said spigot being disposed in the plane of said crystal and aligned substantially with the center of the active area thereof;

first support means including a flexible diaphragm which is fixed to said frame and extends across it so as to complete said enclosure, said diaphragm laterally surrounding said spigot and engaging same;

second support means which are laterally rigid and which are attached to said frame and to said spigot, said first and second support means each being arranged to restrain said spigot resiliently in a longitudinal direction and rigidly in a lateral direction and to clamp said crystal between said spigot and said base; and

electrical connections to said crystal, said connections extending outside said enclosure.

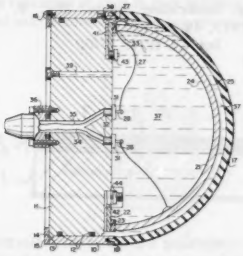
3,891,871
PRESSURE RELEASE HEMISPHERICAL PIEZOELECTRIC TYPE TRANSDUCER

Theodore A. Henriquez, and Allan C. Tims, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1974, Ser. No. 473,050

Int. Cl.² H01L *41/04*

U.S. Cl. 310—9.1 **4 Claims**



1. A piezoelectric transducer; which comprises,

a solid cylindrical backing mass,

a hemispherical piezoelectric ceramic active element secured at the major diameter thereof to one end face of said backing mass,

a ring of insulating material insulating said active element from said backing mass, and

a layer of fiberglass bonded between said backing mass and said insulating ring.

3,891,872
THICKNESS-EXTENSIONAL MODE PIEZOELECTRIC RESONATOR WITH POISSON'S RATIO LESS THAN ONE-THIRD

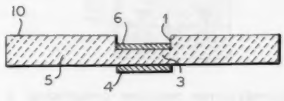
Takashi Nagata, Ikeda, Japan, and Raymond David Mindlin, New York, N.Y., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 304,417, Nov. 7, 1972, abandoned. This application June 20, 1974, Ser. No. 481,451

Claims priority, application Japan, Nov. 12, 1971, 46-90816; Nov. 12, 1971, 46-90817

Int. Cl. H01v *7/00*

U.S. Cl. 310—9.5 **9 Claims**



1. A piezoelectric resonator comprising a thin plate of piezoelectric material having a Poisson's ratio less than one-third, said plate having two flat spaced major surfaces on opposite sides thereof and a flat bottomed recess in at least one of said two major surfaces, and a pair of electrodes, one on the bottom of said recess and the other on the major surface at least in the area opposite the position of said recess, said recessed part of said plate vibrating in the fundamental thickness-extensional mode at a pre-selected frequency when an electrical signal is applied thereto, the thickness t of said plate at said recess and the thickness t' of said plate at said flat part being in the relationship $(N_{T.i}/2N_S) < (t/t') < (N_{TS}/N_{T.i})$ where N_S, N_{TS} and $N_{T.i}$ are frequency constants for the thickness-shear vibration, the thickness-extensional vibration and the anti-resonant thickness-extensional vibration, respectively, whereby the resonant frequency of said fundamental

thickness-extension vibration of said plate at said recessed part is higher than the resonant frequency of said plate at said flat part.

3,891,873

PIEZOELECTRIC RESONATOR WITH MULTI LAYER ELECTRODES

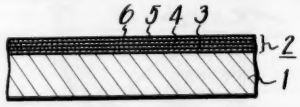
Yuzuru Yanagisawa, Fujisawa, and Hidemasa Tamura, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 30, 1973, Ser. No. 420,465

Claims priority, application Japan, Dec. 9, 1972, 47-123653; Oct. 6, 1973, 48-112726

Int. Cl. H04r *17/00*

U.S. Cl. 310—9.7 **6 Claims**



1. A resonator comprising a plate of piezoelectric material containing lithium, electrodes formed on opposite sides of said plate and each electrode comprising a first layer of chromium adjacent said piezoelectric plate, a second layer of copper formed over said first layer, a third layer of chromium formed over said second layer, and a fourth outer layer of a noble metal formed over said third layer.

3,891,874

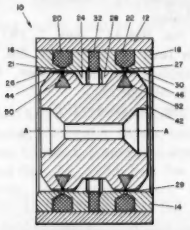
COMPENSATED RECIPROCATING ELECTRODYNAMIC MACHINE

Herbert C. Roters, deceased, late of Nogales, Ariz., by Mary D. Roters, executrix, Nogales, A iz., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 31, 1973, Ser. No. 365,584

Int. Cl. H02k *33/00*

U.S. Cl. 310—14 **26 Claims**



1. An electrodynamic machine comprising: a magnetic circuit having an axially polarized constant flux source and axially spaced wound stator poles with slots and tooth tips which simultaneously confront the axially spaced poles of an axially movable flux conducting armature through an air gap; and means establishing low resistance current paths in each of said armature poles operative to cancel alternating flux in said armature poles.

3,891,875

SUPERCONDUCTING ROTOR

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1973, Ser. No. 406,881

Int. Cl. H02k *9/00*

U.S. Cl. 310—40 **20 Claims**

1. A superconducting rotor for a dynamoelectric machine, the superconducting rotor being of the type having a field winding and an amortisseur winding and including:

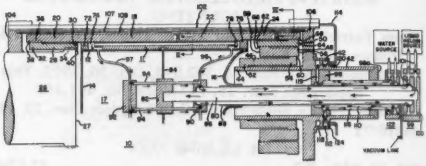
a. means for maintaining said field winding in a superconducting state;

b. means for maintaining said amortisseur winding in a normally conducting state;

c. a support cylinder having a first end portion, a middle portion, and a second end portion, said field winding being disposed interiorly of and coaxially with said middle portion of said support cylinder in fixed relation thereto;

d. a drive shaft having a first end disposed interiorly of said first end portion of said support cylinder;

e. a carrier cylinder having a first end disposed interiorly of said second end portion of said support cylinder, said amortisseur winding fixedly securing said drive shaft to said carrier cylinder;



f. first insulating ring means for securing said support cylinder to said drive shaft, said first insulating ring means providing a circuitous heat conducting path between said first end of said drive shaft and said first end portion of said support cylinder; and,

g. second insulating ring means for mounting said support cylinder on said carrier cylinder to allow axial movement therebetween, said second insulating ring means providing a circuitous heat conducting path between said first end of said carrier cylinder and said second end portion of said support cylinder.

3,891,876

PERMANENT MAGNET ELECTRIC MOTOR HAVING A NON-FERROUS SOLID ARMATURE

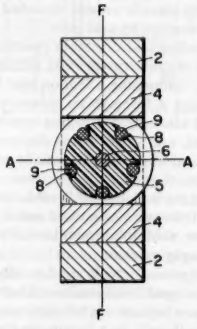
John A. Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 427,178, Dec. 21, 1973, abandoned.

This application Aug. 2, 1974, Ser. No. 494,265

Int. Cl.[2] H02K *1/04*

U.S. Cl. 310—43 **5 Claims**



1. In an electric motor, a single solid non-magnetic cylindrical armature having commutated windings thereon, means for

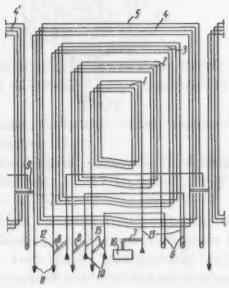
rotationally mounting said armature about the cylindrical axis thereof radially within a single air gap formed by peripheral permanent magnets having oppositely polarized pole faces facing the axis of said armature.

3,891,877

DIRECTLY LIQUID COOLED ROTOR WINDING FOR A NON-SALIENT POLE SYNCHRONOUS ELECTRIC MACHINE

Aron Beniaminovich Shapiro, Basseinaya ulitsa 53, kv. 70; Vladimir Pavlovich Chernyavsky, Pulkovskaya ulitsa 17, kv. 185; Ibragim Akhmedovich Kadi-Ogly, ulitsa Chaikovskoga 15, kv. 24, and Jury Grigorievich Tjurin, V.O. 8 Linia 55, kv. 1, all of Leningrad, U.S.S.R.

Filed Apr. 16, 1973, Ser. No. 351,766
Int. Cl. H02k *1/32*
U.S. Cl. 310—61 **3 Claims**



1. A directly liquid cooled rotor winding for a synchronous electric machine having non-salient poles, comprising: windings of said poles of said rotor; concentrically arranged and wound in a similar direction coils included in said winding of each one of said poles; leads of said coils, positioned to one side of said rotor and projecting beyond the coil end portion of said rotor; directly liquid cooled auxiliary U-shaped conductors arranged concentrically to each other under said face end portion of said rotor, said auxiliary conductors electrically connecting said coils in serial relationship; ends of said auxiliary connectors extending axially beyond said coil end portion in the respective sectors of the upper and of the lower ones of said leads of said coils, said auxiliary conductors being electrically connected with the respective ones of said leads either directly or through jumpers of solid cross-section, inter-pole electric connections being effected in the area of the axial portion of said coil end portion of said rotor, on the side thereof where said coil leads are positioned, with the help of at least two jumpers of solid cross-section, each one of said jumpers connecting the upper conductor adjoining the lead of the biggest coil of the respective one of said poles to the adjacent upper conductor of the biggest coil of the other one of said poles.

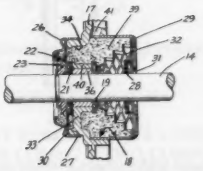
3,891,878

DYNAMOELECTRIC MACHINE HAVING IMPROVED LUBRICATION SYSTEM

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Feb. 14, 1973, Ser. No. 332,265
Int. Cl. F16c *1/24, 33/66, 13/02*
U.S. Cl. 310—90 **13 Claims**

1. In a dynamoelectric machine comprising a stator assembly and a rotor assembly having a shaft, said stator assembly including an end frame, a bearing supported in said end frame and a lubrication system of the type wherein lubricant flows from a lubricant reservoir to an oilwicking material in contact with the shaft for feeding lubricant to a bearing and then recirculates to the lubricant reservoir, the lubrication system comprising a lubricant reservoir, an extrudable lubricant retaining base material within at least a portion of the reservoir for storing lubricant therein and for supplying lubricant to the bearing, the improvement wherein: the lubrication system comprises means for retaining the base material within a predetermined locale in the reservoir and for promoting the recirculating movement of lubricant from the vicinity of the bearing to the base material in the predetermined locale; said means for retaining at least in part defining the predetermined locale and said means for retaining comprising a mesh basket



member having a plurality of openings through which circulating lubricant may pass in one direction and through which the free passage of an extrudable lubricant retaining base material in a direction opposite to the one direction is inhibited, said basket member extending axially relative to the shaft and defining a cavity about at least a portion of the shaft.

3,891,879

ROTOR FOR A HYSTERESIS MOTOR

Keiko Yamada; Kimiyuki Kamino, and Toshiro Kubota, all of Tokyo, Japan, assignors to Mitsubishi Seiko Kabushiki Kaishi, Tokyo and Kyoei Denshi Kogyo Kabushiki Kaisha, Honjyo, both of, Japan

Filed June 25, 1974, Ser. No. 483,003
Int. Cl. H02k *19/08, 21/46*
U.S. Cl. 310—163 **2 Claims**

1. A rotor for a hysteresis motor comprising a cylindrical laminated core of silicon steel plates having a cage winding, a sheet-like flexible plastic magnetic material secured to the outer periphery of said core without being magnetized and a coating of a filler adhesive fixedly secured to the outer periphery of said sheet-like flexible plastic magnetic material, said sheet-like flexible plastic magnetic material being anisotropic in the thickness direction of the sheet and having such magnetic properties as not less than 2.2 KG residual magnetic flux density Br, not less than 1.2 KOe coercive force ${}_BH_C$ and not less than 1.1 MGOe maximum magnetic energy product (BH)max and not greater than 4 KOe minimum intensity of magnetic field necessary for saturation Hs, said sheet-like flexible plastic magnetic material further having a knee point in its hysteresis loop located in the second quadrant of the B-H diagram, said coating of a filler adhesive comprising the powders of materials having high magnetic permeability such as iron, and synthetic resins.

3,891,880
HIGH VOLTAGE WINDING WITH PROTECTION AGAINST GLOW DISCHARGE

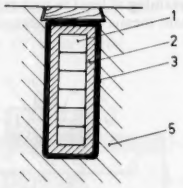
Helmut Britsch, Gebenstorf, Switzerland, assignor to BBC Brown Boveri & Company, Baden, Switzerland

Filed May 18, 1973, Ser. No. 361,648

Claims priority, application Switzerland, June 16, 1972, 8938/72

Int. Cl. H02k *3/40*

U.S. Cl. 310—196 **13 Claims**



1. An insulated high-voltage winding installed in the slots of the stator component of an electrical machine and wherein external glow-protection means are provided between the insulation on said winding and the slotted portion of said stator, said external glow-protection means being constituted by a wound-on impregnatable woven tape of an electrically semi-conductive material covering the entire surface of said winding insulation, the warp threads of said woven tape consisting of a pre-stretched non-heat set and heat contractible filamentary material having an organic polymeric structure and the weft threads thereof consisting of dimensionally stable filaments.

3,891,881
MAGNETIC POLES

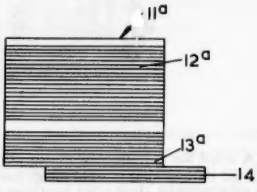
John Derek Harris, and Francis Roy Wood, both of Solihull, England, assignors to The Lucas Electrical Company Ltd., Birmingham, England

Continuation of Ser. No. 356,058, April 30, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,543

Claims priority, application United Kingdom, May 3, 1972, 20679/72

Int. Cl. H02k *1/14*

U.S. Cl. 310—218 **4 Claims**



1. A magnetic pole assembly comprising:

a pair of magnetic poles;

a magnetic yoke assembly interconnecting said poles;

an electromagnet winding through which an electric current is passed to generate a flow of magnetic flux in the magnetic pole assembly;

each of said poles being constructed of a single strip of magnetic material bent back and forth upon itself so that successive convolutions are interconnected to each other at opposite ends to define a stack of convolutions in face to face contact;

each of said poles being attached to said yoke assembly in such a manner that flux traveling from the yoke through the poles or vice versa travels substantially perpendicular to the plane of the convolutions of said poles.

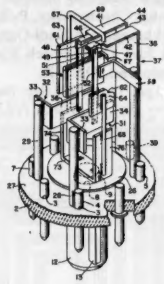
3,891,882
IONIZATION GAUGE

Anthony J. Barraco, 5499 Blossom Tree Ln., San Jose, Calif. 95124

Filed Jan. 3, 1974, Ser. No. 430,598

Int. Cl. H01j *7/16*

U.S. Cl. 313—7 **15 Claims**



13. In a thermionic ionization gauge for measuring vacuum pressures in the order of 10^{-6} Torr, the combination comprising:

a. at least one elongated filament mounted so that any thermal elongation thereof is accomodated so as to prevent lateral displacement of any part of the filament;

b. an electron collector mounted in spaced relationship with said elongated filament whereby thermal expansion of the electron collector occurs in a direction which does not alter the spaced relationship thereof with the associated filament;

c. at least one ion collector mounted in spaced relationship with said elongated filament on the side thereof opposite said electron collector, the width of said ion collector being orders of magnitude greater than the width of said filament, and the length of said ion collector being almost as long as said filament; and

d. means physically joining and electrically isolating said filament, electron collector and ion collector so that separate electrical potentials may be selectively applied thereto.

3,891,883
DISCHARGE DISPLAY PANEL INCLUDING A SUBSTRATE SUPPORTING PLURAL CATHODES AND RECESSED ANODES

Abbas Mesbahuddin Ahmed, Beauford Manor, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

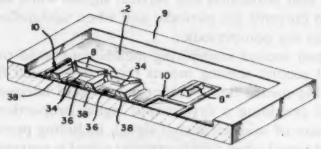
Continuation-in-part of Ser. No. 300,631, Oct. 25, 1972, Pat. No. 3,818,556. This application May 9, 1974, Ser. No. 468,356

Int. Cl.[2] H01J *17/32, 61/12*

U.S. Cl. 313—54 **4 Claims**

1. A glow discharge readout device, comprising: a fusible ceramic substrate, portions of the substrate forming elevated platforms, the platforms receiving cathodes therein arranged in a desired pattern, contact pins imbedded in said substrate and in contact with corresponding cathodes, anodes affixed to the substrate and generally recessed with respect to said cathodes, additional contact pins imbedded in said substrate and in contact with corresponding anodes, said anodes and cathodes being encapsulated in a transparent sealed envelope filled with an illuminating gas, and upon impressing an electrical potential between said anodes and selected cathodes, electrons will be caused to flow from said selected cathodes in a direction focused toward said relatively recessed anodes and

toward the surface of the substrate and away from said transparent sealed envelope, thereby preventing discoloration of said transparent envelope by electron collision therewith, portions of said anodes being encircled by selected cathodes,



said encircled portions of said anodes being interconnected by bridging anode portions imbedded in and extending beneath said elevated platforms on which said selected cathodes are located.

3,891,884

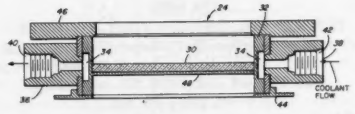
ELECTRON DISCHARGE DEVICE HAVING ELECTRON MULTIPACTOR SUPPRESSION COATING ON WINDOW BODY

Lawrence H. Tisdale, Wakefield, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 266,020, June 26, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,435

Int. Cl. H01j *43/28;* **H01p** *1/08*

U.S. Cl. 313—107 **2 Claims**



1. An electron discharge device comprising:

an evacuated envelope having an access opening for propagating electromagnetic energy;

a body of a dielectric material sealing said access opening;

a coating of a semiconducting oxide material of a transition metal having a thickness averaging about 1,000 Angstrom units on the surface of said dielectric body exposed to the vacuum to suppress electron multipactoring.

3,891,885

HALOGEN INCANDESCENT LAMP

Ewald Wurster, Grunwald, Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Germany

Filed Jan. 16, 1974, Ser. No. 433,726

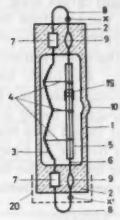
Claims priority, application Germany, Feb. 7, 1973, 2305960

Int. Cl.[2] H01R *1/24, 1/54*

U.S. Cl. 313—178 **11 Claims**

1. In a halogen incandescent lamp comprising a tubular envelope (1) closed at each end by a press stem (2) with foil seals (7), each, a double-coiled tungsten filament (3), a gettering substance (15) inside the envelope and means (5, 11) supporting the filament inside the envelope,

wherein the filament extends transversely across the tubular envelope, from one end of the press stem (2) to the other; the filament support means comprises a support tube (5, 11) of fused silica secured to at least one of the press stems (2) and located inside the envelope, and a plurality of support wires (4) secured in torsion-resistant manner to the silica tube, the support wires being spaced from each other along the length of the tube and having, alternatingly, different lengths, the support wires supporting



the filament extending between said press stems in zig-zag position in the lamp envelope.

3,891,886

CATHODE RAY TUBE HAVING A LUMINESCENT SCREEN INCLUDING A TWO COMPONENT WHITE-EMITTING PHOSPHORIC MIXTURE

Leo Woontner, Marion, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 811,532, March 28, 1969. This application Mar. 10, 1971, Ser. No. 122,720

Int. Cl. H01j *29/20;* **C09k** *1/04*

U.S. Cl. 313—467 **5 Claims**

1. A cathode-ray tube comprising an evacuated envelope, a luminescent screen within said envelope and electron-producing means for exciting said screen to luminescence within said envelope, said luminescent screen including at least one white-emitting area consisting essentially of a mixture of:

a. 54 to 58 weight percent of a blue-emitting silver-activated zinc sulfide phosphor containing between 0.010 and 0.030 weight percent silver and

b. 46 to 42 weight percent of a yellow-emitting copper-and-aluminum-activated zinc cadmium sulfide phosphor having the composition mZnS.nCdS:Cu(o),Al(p) wherein: m is between 0.83 and 0.88 parts by weight, n is between 0.12 and 0.17 parts by weight, m plus n equals 1.0, o is between 0.001 and 0.009 weight percent and p is not less than o.

3,891,887

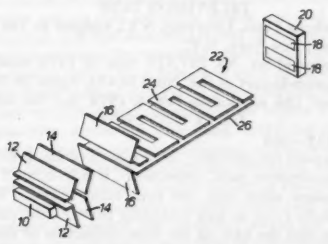
SEMICONDUCTOR DEVICES

David Edward Barry, Braintree, and Peter Edward Steigmann, Heybridge, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 3, 1973, Ser. No. 403,043

Int. Cl. H01j *23/16, 27/96*

U.S. Cl. 315—3 **3 Claims**



1. In a vacuum tube such as an electron beam semiconductor amplifier including a semiconductor crystal having a p-n junction target area adapted to be bombarded with electrons, an electron beam source spaced from said target area and adapted to generate a beam of electrons of sufficient intensity

as to give off x-rays incidental to bombardment of the target area with such beam of electrons, and a deflection system between said source and said target area to deflect said electron beam to bombard said target area, and an oxide insulation layer on the crystal, the interface between the semiconductor material of the crystal and the oxide insulation layer being sensitive to x-rays, the improvement wherein said crystal includes a planar surface, the oxide insulation layer being formed on said planar surface to define a planar x-ray sensitive interface and said p-n junction being formed at said planar surface to define a planar target area spaced from said x-ray sensitive interface, and a barrier of x-ray absorbent material is provided in a direct line between the interface defining said target area and the x-ray sensitive interface.

3,891,888

ROAD VEHICLE LIGHTING SYSTEMS

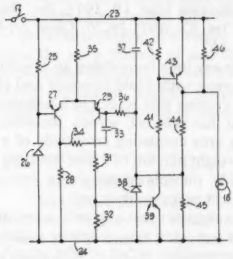
John Peter Southgate, Sutton Coldfield, England, assignor to The Lucas Electrical Company Ltd., Birmingham, England

Filed Mar. 25, 1974, Ser. No. 454,380

Claims priority, application United Kingdom, May 19, 1973, 23963/73

Int. Cl. H01j *29/00*

U.S. Cl. 315—82 **6 Claims**



1. A road vehicle lighting system including at least one tungsten-halogen lamp having a rated operating voltage range and a regulator connected with the lamp for maintaining the voltage across the lamp within said operating voltage range of the lamp, said regulator including a transistor in series with the lamp, said transistor including a base, collector and emitter, and means for switching the transistor on and off to regulate the voltage across the lamp, and a resistor connected across the collector-emitter of the transistor.

3,891,889

COLOR CONVERGENCE APPARATUS FOR A COLOR TELEVISION TUBE

James Anthony Fazio, Liverpool, N.Y., assignor to The Singer Company, New York, N.Y.

Continuation of Ser. No. 287,523, Sept. 8, 1972, which is a continuation-in-part of Ser. No. 138,492, April 29, 1971, abandoned. This application Feb. 6, 1974, Ser. No. 440,111

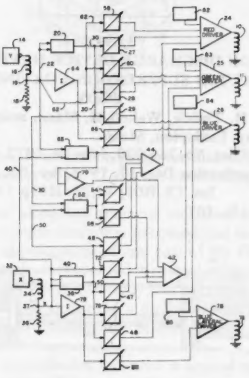
Int. Cl. H01j *29/70*

U.S. Cl. 315—368 **7 Claims**

1. Apparatus for providing convergence of the three beams from three electron guns, respectively, in a tri-color TV tube of the shadow mask type, the guns being disposed along a circle radially from an axis extending between the center of the screen and the base of the tube, deflection of the three beams on the screen of the tube being responsive to both periodic currents and non-periodic currents provided to the horizontal and vertical coils of a deflection yoke around the neck of the tube, said tube also having a convergence yoke comprised of at least three convergence coils respectively corresponding to said guns, for providing additional deflection to each of said respective guns in response to convergence currents provided to each convergence coil comprising:

first and second sensing means connected to the horizontal and vertical deflection coils respectively for providing horizontal and vertical signals proportional to the horizontal and vertical deflection currents, including providing said horizontal and vertical signals when said deflection currents are periodic and when said deflection currents are non-periodic;

first and second multiplying means connected to said first and second sensing means respectively, said first multiplying means being responsive to said horizontal signal and providing a first output signal proportional to the square of said horizontal signal, including providing said first signal when said horizontal signal is representative of a periodic signal and when said horizontal signal is representative of a non-periodic signal, said second multiplying means being responsive to said vertical signal and providing a second output signal proportional to the square of said vertical signal, including providing said second signal when said vertical signal is representative of a periodic signal and when said vertical signal is representative of a non-periodic signal;



signal attenuating means connected to said horizontal, vertical, first and second signals for providing a plurality of selectively attenuated signals, including at least one attenuated signal for each of said horizontal, vertical, first and second signals; and

first, second and third combining means, each responsive to selected ones of said attenuated signals and each providing a convergence current representative of a combination of said attenuated signals to one of the convergence coils for providing convergence to the beams of the three electron guns when said beams are deflected in response to periodic currents and when said beams are deflected in response to non-periodic currents.

3,891,890

LIGHT PEN POSITION DETECTOR FOR COLOR DISPLAY DEVICE

Isao Yasuda, and Akira Osawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 3, 1973, Ser. No. 385,335

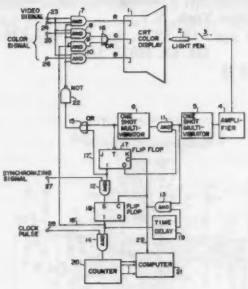
Claims priority, application Japan, Aug. 7, 1972, 47-78381

Int. Cl. G06k *15/20*

U.S. Cl. 315—365 **11 Claims**

7. In a color display device for displaying in color a desired pattern on the screen of a cathode-ray tube, an apparatus for detecting a given position on said screen of said cathode-ray

tube indicated by a light pen comprising means for stopping the display on said screen of said cathode-ray tube in response to a light detection signal from said light pen indicating a given position on said screen of said cathode-ray tube, means for detecting the lapse of time t following the stoppage of the



display on said screen of said cathode-ray tube, means for starting a monochromatic scanning following the lapse of time t, and counter means to start its counting operation simultaneously with the starting of the monochromatic scanning, the counting operation being stopped by a light detection signal from said light pen.

3,891,891

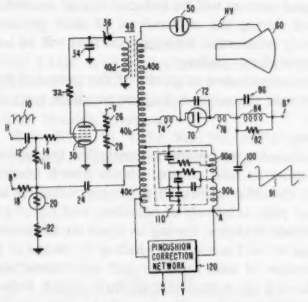
HIGH VOLTAGE PROTECTION CIRCUIT

John Stark, Jr., Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,324

Int. Cl. H01j *29/70*

U.S. Cl. 315—379 **10 Claims**



1. A high voltage protection system for controlling a generated high voltage supplied to a kinescope, comprising:

means for producing a viewable display on said kinescope including a controlled current conducting device having at least a first control electrode;

means coupled to said means for producing a viewable display for having alternating current voltage variations excited therein in response to the conduction of said controlled current conducting device, said voltage variations determining said generated high voltage; and

means, including a rectifying and regulating device and filtering and storage means, coupled to said means for having voltage variations excited therein and to said first control electrode of said controlled current conducting device, for rectifying an alternating current voltage derived from said means for having voltage variations excited therein when said rectifying and regulating device is forward biased and for filtering and storing said rectified voltage for providing direct current voltage to said first control electrode which provides for conduction of said controlled current conducting device, said rectifying and regulating device conducting in a reverse direction when the difference between said stored voltage and said alternating current voltage exceeds a predetermined value for regulating said direct current voltage supplied to said control electrode of said controlled current conducting device for controlling said generated high voltage.

3,891,892

START-UP CONTROL CIRCUIT FOR SCR DEFLECTION

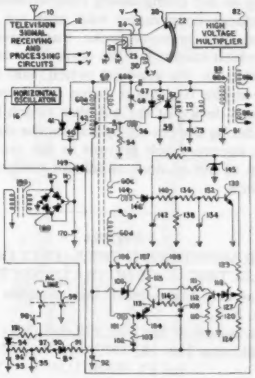
Walter Bohringer, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 4, 1973, Ser. No. 421,704

Claims priority, application Switzerland, Sept. 12, 1973, 42812/73

Int. Cl. H01j *29/70*

U.S. Cl. 315—411 **9 Claims**



1. A boost voltage delay system for switching loss protection in a deflection system comprising:

a deflection winding;

a source of direct current voltage;

inductive means coupled to said direct current voltage source;

first and second deflection switching means coupled to each other and to said inductive means and said deflection winding, said first switching means operative from a first to a second state for providing a current path through said inductive means for a portion of each deflection cycle;

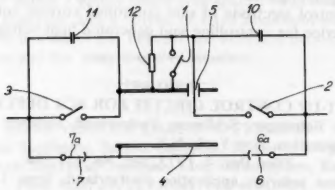
controllable voltage generating and rectifying means coupled to said direct current voltage supply and to said inductive means for generating, rectifying and adding boost voltage to said direct current voltage is response to said flow of current through said inductive means; and

boost voltage delaying means including rectifying means coupled to said inductive means and to said controllable voltage generating and rectifying means for generating signals in response to said flow of current through said inductive means and for rectifying said signals in said rectifying means for supplying a delayed control voltage for said controllable voltage generating and rectifying means for delaying the supply of said rectified boost voltage to said first switching means.

3,891,893
HIGH-VOLTAGE POWER SWITCH

Richard Thaler, Uterentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed May 24, 1974, Ser. No. 473,323
Claims priority, application Switzerland, May 28, 1973, 7625/73
Int. Cl. H02h *7/22*
U.S. Cl. 317—11 A **5 Claims**

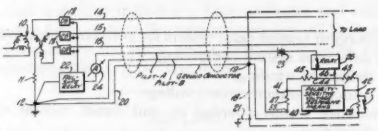


5. A high-voltage power switch arrangement composed of at least two power switching locations comprising at least one oil-poor switch and at least one gas-blast switch, said oil-poor switch having an arc extinguishing compartment, a pressure-stroke transducer cooperating with said arc extinguishing compartment, said pressure-stroke transducer including a component which carries out the stroke movement, a pump device provided for the gas-blast switch, said component of the pressure-stroke transducer being operatively connected with said pump device of the gas-blast switch in order to be able to use, during the cut-off operation, the current-dependent pressure energy which prevails in the arc extinguishing compartment of the oil-poor switch for the actuation of the gas-blast switch.

3,891,894
MEANS FOR MONITORING THE SAFETY OF A REMOTE ELECTRICAL GROUND CONNECTION

Leopoldo Scarpino, Indianapolis, Ind., assignor to Amax Inc., New York, N.Y.

Continuation-in-part of Ser. No. 358,468, May 9, 1973. This application July 16, 1973, Ser. No. 379,243
Int. Cl. H02h *3/16*
U.S. Cl. 317—18 C **30 Claims**

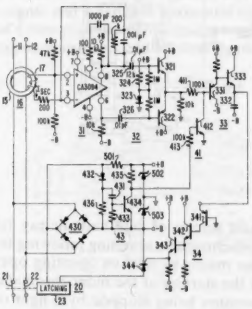


1. Elongate transmission-line means having a source-connection end and a remote load-connection end and comprising power-conductor means, a ground conductor and at least two pilot conductors; a d-c conducting connection of said two pilot conductors at the source-connection end; a d-c conducting connection of said two pilot conductors at the load-connection end; thereby establishing separate d-c conducting paths through the respective pilot conductors; means for impressing a d-c potential across the full length of said ground conductor, said last-mentioned means including a d-c source in one of said paths and a circuit connection of said one path and said ground conductor at the load-connection ends thereof; and d-c responsive resistance-monitoring means at the load-connection end and including a reference connection to the source-connection end of said ground conductor via the other of said paths, said resistance-monitoring means being also connected to the load-connection end of said ground conductor and thus tracking the instantaneous effective resistance between the source-connection and load-connection ends thereof.

3,891,895
GROUND FAULT DETECTION

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,226
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 D **16 Claims**



1. Ground-fault detection apparatus for use with a plurality of a-c power line conductors comprising:

a differential transformer having a plurality of primary windings and a secondary winding, each of said primary windings being arranged for inclusion in one of said a-c power line conductors so that in the absence of a ground fault in any of said power line conductors substantially no a-c signal current will be induced in said secondary winding and during the occurrence of such ground fault a relatively substantial a-c signal current will be induced in said secondary winding;

a detector responsive to peaks of the potential between a pair of said primary windings to produce a set of control pulses;

a rectifier;

a transmission gate having a controlled transmission path responsive to said control pulses which control pulses render the otherwise relatively non-conductive said transmission path relatively conductive; and

an amplitude detector, having an input circuit intermittently coupled to said secondary winding by means of a cascade connection of said rectifier and said transmission gate, and having an output circuit from which indications of resistive ground faults are supplied.

3,891,896
VACUUM CIRCUIT INTERRUPTER

Jan Christiaan Clason, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Jan. 29, 1974, Ser. No. 437,646
Claims priority, application Netherlands, Jan. 30, 1973, 7301313
Int. Cl. H02h *7/22*
U.S. Cl. 317—58 **3 Claims**

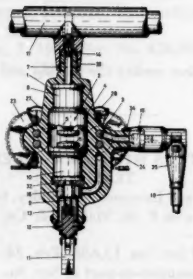
1. Vacuum circuit interrupter and current transformer switching apparatus comprising:

a hermetically sealed evacuated housing including two contact members;

a first contact rod mounted immovably along the longitudinal axis of said housing and extending in sealing relationship to the exterior of said housing;

a second contact rod mounted to be movable along the longitudinal axis of said housing and extending to the exterior of said housing through a sealing electric insulator and bellows;

a first contact member supported by said first contact rod; a second contact member movably supported by said second contact rod; and



a coil wound around said first and second contact members coaxially with respect to said first and second contact rods, one end of said coil being electrically connected in series to one of said contact rods and the other end of said coil being connected to a plug terminal within said housing, whereby the current flow through said coil generates a magnetic field at said two contact members along the longitudinal axis of said housing, said coil being embedded in an insulating material and forming a primary winding of at least one current transformer.

3,891,897

VOLTAGE OVERLOAD ARRESTER FOR HIGH-VOLTAGE SWITCHING SYSTEMS

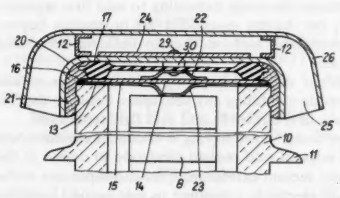
Werner Jakszt, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 17, 1973, Ser. No. 397,921

Claims priority, application Germany, Sept. 27, 1972, 2247997

Int. Cl. H02h *3/22*

U.S. Cl. 317—62 **3 Claims**



1. In a high-voltage switching system voltage overload arrester, of the type including a metallic arrester housing containing a gaseous insulating medium, spark gaps and voltage dependent current discharge resistors coupled in series thereto, and an electrically nonconductive housing, containing another gaseous insulating medium, disposed within the arrester housing, in which the spark gaps and resistors are disposed, the improvement comprising a diaphragm comprising a layer of electrically conductive metallic material, electrically coupled to said arrester housing and discharge resistors, and disposed over at least one end of said nonconductive housing and fastened thereto about the periphery of said diaphragm by a metallic gas-impermeable solder joint, said solder joint comprising a layer of metallic material fastened to an end face of said nonconductive housing and solder material joining said diaphragm to said layer of metallic material; a rubber seal engaging said diaphragm; and a metallic cap, disposed over the endface of said nonconductive housing and secured thereto by a cement joint, and spaced apart from said diaphragm by said rubber seal.

3,891,898

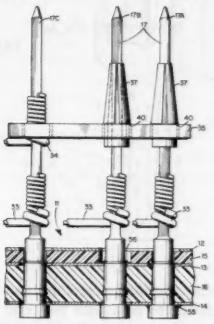
PANEL BOARD MOUNTING AND INTERCONNECTION SYSTEM FOR ELECTRONIC LOGIC CIRCUITRY

Neil F. Damon, Cumberland, R.I., assignor to Augat, Inc., Attleboro, Mass.

Filed Oct. 11, 1973, Ser. No. 405,500

Int. Cl. H05k *1/04*

U.S. Cl. 317—101 CC **8 Claims**



1. A mounting and interconnection system for electronic logic circuitry, said system comprising:

a dielectric panel board;

a first conductive layer on a first side of said panel board; a second conductive layer on the second side of said panel board;

a plurality of arrays of elongated pins mounted in said panel board and projecting substantially perpendicularly from said first side of said board, said elongated pins being wire wrapping pins, some of which have at least one interconnecting wire wrapped around it at the first wire wrapping level adjacent said board, some of said elongated pins having two interconnecting wires wrapped therearound, the second wrapping being located at the second wire wrapping level adjacent the first wire wrapping and spaced from the distal end of said pins;

an electronic interconnection element comprising printed circuitry mounted to dielectric material and having a plurality of holes therethrough to receive all the pins of one of said arrays, said printed circuitry being formed to selectively interconnect said holes, said electronic interconnection element comprising a flat dielectric substrate having a configuration substantially similar to the outline shape of one of said arrays, said holes in said substrate being of sufficient size to accomodate one of said pins and the coil of wire wrapped around it; and

a plurality of contact members mounted in selected ones of

said holes in said substrate, said contact members being configured to engage said pins, said selected holes in said substrate having contact members mourted therein corresponding to ones of said pins having less than two interconnecting wires wrapped therearound, the remaining holes in said substrate corresponding to said elongated pins having at least two interconnecting wires wrapped therearound;

wherein said substrate is mounted to said array of pins in a position substantially parallel to said panel board, said pins projecting through said substrate and said contact members.

3,891,899

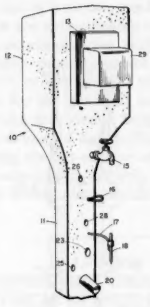
CONCRETE UTILITY POST WITH METER, GAS LINE AND WATER LINE

Donald F. Sparling, P.O. Box 2294, Delray Beach, Fla. 33444

Division of Ser. No. 163,919, July 19, 1971, abandoned. This application June 26, 1973, Ser. No. 373,641

Int. Cl. H02b *9/00*

U.S. Cl. 317—105 **4 Claims**



1. A precast concrete utilities post apparatus having a reinforced elongated concrete post with two end portions, one said end portion being larger than the other said end portion, a meter box and a power box found in said large portion of said concrete post, said meter box having an opening from one side of said post and said power box having an opening from a second side of said post and having conduit connected to said meter box passing through a portion of said post, said meter box and said power box being operatively connected to each other; a water line located in said elongated concrete post, said water line having a tapped output from said elongated post; and an electrical ground wire electrically connecting said meter and power boxes from said elongated concrete post for insertion into the earth for grounding said meter and power boxes.

3,891,900

CONTROL SYSTEM FOR VEHICLE GATES

Terry B. Gallant, San Diego, Calif., assignor to Automation General, San Diego, Calif.

Filed Dec. 7, 1973, Ser. No. 422,853

Int. Cl. H01h *47/14*

U.S. Cl. 317—139 **11 Claims**

1. A control system for motor driven gates comprising:

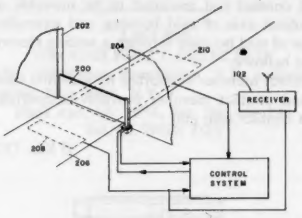
a gate close timer,

a gate open relay,

a gate close relay,

a single signal control input means for selectively closing and latching said gate open relay, and charging said gate close timer,

open limit switch responsive means for unlatching said gate open relay and for starting the cycle of said timer,



timer responsive means for closing and latching said gate close relay.

3,891,901

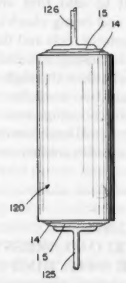
CAPACITORS WITH SPRAYED ELECTRODE TERMINALS

James M. Booe, and Lawrence A. Landry, both of Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 13,688, Feb. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 732,928, May 29, 1968, abandoned. This application Aug. 5, 1971, Ser. No. 169,554

Int. Cl. H01g *1/14*

U.S. Cl. 317—258 **24 Claims**



1. A capacitor comprising:

at least two adjacent, spaced apart, first and second metal electrodes;

at least one separating dielectric layer in contact with at least a portion of said electrodes;

said layer having a first extension beyond a first edge of said first electrode to define, at the edge of said first extension, a first separator surface;

said second electrode extending to said first separator surface, but having essentially no protrusion beyond said first separator surface, thereby defining a first electrode surface;

a dielectric material covering said first edge of said first electrode and filling any void space between the first edge of said first electrode and said first separator;

said separator layer having a second extension beyond a first edge of said second electrode to define at the edge of said second extension, a second separator surface;

said first electrode extending to said second separator surface but having essentially no protrusion beyond said second separator surface, thereby defining a second electrode surface;

a dielectric material covering said first edge of said second electrode and filling any void space between the first edge of said second electrode and said second separator surface;

a first deposit of nickel-aluminum material consisting essentially of about 50 to 98 weight percent nickel, weld-bonded to said first electrode surface to provide a terminal; and

a second deposit of nickel-aluminum material consisting essentially of about 50 to 98 weight percent nickel, weld-bonded to said second electrode surface to provide a terminal, the terminal to electrode bond strength being at least about 300 psi.

3,891,902

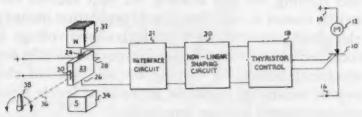
SPEED CONTROL UNIT FOR ELECTRIC VEHICLES

Charles Edward Konrad, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 3, 1973, Ser. No. 420,889

Int. Cl.[2] H02P *5/16*

U.S. Cl. 318—139 **5 Claims**



1. Speed controlling means for a vehicle powered by an electric traction motor coupled to a source of d.c. potential comprising:

magnetic means for producing a magnetic field in a predetermined location;

Hall effect means disposed in the field produced by said magnetic means;

a first pair of electrodes coupled to the Hall effect means for providing a current path to a source of d.c. potential;

a second pair of electrodes coupled to said Hall effect means for receiving an output voltage which varies as a function of position of said Hall effect means;

manually operable means for rotating said Hall effect means with respect to said magnetic means;

a thyristor for coupling the d.c. traction motor to the d.c. source;

thyristor control means for varying the mark-space ratio of the thyristor as a function of an applied control voltage; and

a shaping circuit for producing an output voltage whose rate of change increases with an increasing input voltage for coupling said second pair of electrodes to said thyristor control means.

3,891,903

DEVICE FOR AUTOMATICALLY STARTING AND STOPPING AN ASYNCHRONOUS MOTOR

Gabriel Selam, 161 Boulevard Edouard Vaillant, 93 Aubervilliers, France

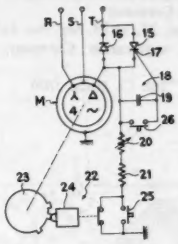
Filed Oct. 10, 1973, Ser. No. 405,109

Claims priority, application France, Oct. 10, 1972, 72.35817

Int. Cl. H02p *3/20*

U.S. Cl. 318—212 **10 Claims**

1. A device for automatically starting and stopping an asynchronous motor having supply phases, said device comprising a variable impedance connected in series in at least one of the supply phases of the motor and means associated with said impedance and responsive to the speed of said motor for automatically decreasing the value thereof as the speed of said motor increases during its starting period and for automatically increasing the value of said impedance as the speed of said motor decreases during its stopping period so as to produce a disequilibrium in the supply of the motor by varying the voltage applied to said at least one phase.



3,891,904

METHODS AND CIRCUIT ARRANGEMENTS FOR SMOOTHING PULSATING VOLTAGES

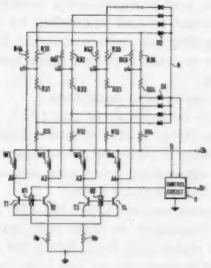
Werner Pollmeier, Verl, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Nov. 23, 1973, Ser. No. 418,237

Claims priority, application Germany, Nov. 24, 1972, 2257713

Int. Cl. H02k *29/00*

U.S. Cl. 318—254 **13 Claims**



6. An apparatus for smoothing pulsating voltages, comprising:

means defining a source of more than two independent and phase shifted alternating voltage components having generally equal peak-to-peak values and having a difference in phase less than 180° between adjacent phase components;

means for limiting the peak value of each of said independent alternating voltage components and producing limited values of said independent alternating voltage components;

means for combining the phase adjacent components of said independent alternating voltage components in pairs and producing alternating summation values; and

means for rectifying and summing said limited values of said phase adjacent independent alternating voltage components and said alternating summation values, whereby twice as many alternating voltage components are summed at said summing means as come from said source means so that the amount of ripple in a total rectified voltage component from said summing means is minimized.

3,891,905
BRUSHLESS D-C MOTOR

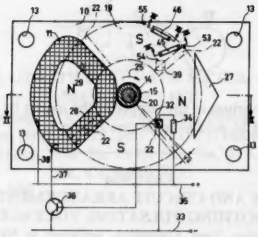
Rolf Müller, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Filed Nov. 27, 1973, Ser. No. 419,416

Claims priority, application Germany, Dec. 8, 1972, 2260069

Int. Cl. Ho2p *5/06*

U.S. Cl. 318—254 **36 Claims**



1. Brushless d-c motor having a stator, an essentially cylindrical permanent magnet rotor (**26**), a substantially cylindrical air gap between the stator and the rotor, a winding (**126; 215, 216**) on the stator, transducer means (**127; 202**) located in fixed relation to the stator, and responsive to the angular position of the rotor and providing an output signal if the rotor has a predetermined relative position with respect to the transducer means, and semiconductor switching means (**36; 245, 246**) connected to and controlled by said transducer means and controlling intermittent current flow through the stator winding to provide a pulsed drive torque (M_{e6}, M_{215}, M_{216}) to the rotor

wherein the improvement comprises

the substantially cylindrical air gap (**133, 134; 230, 231**) between the stator and the rotor having nonuniform radial dimension at different circumferential locations to generate an alternating reluctance torque upon rotation of the permanent magnet rotor;

permanent magnet means (**137, 138; 226, 227**) located on the stator comprising at least one permanent magnet located on a stator pole face, facing the air gap;

said permanent magnet means and said air gap of nonuniform radial dimension being located, shaped, and dimensioned with respect to each other as well as with respect to the magnetic field generated by said winding to provide, upon interaction with the permanent magnet rotor, a torque component (**79; FIG. 18-d**) which is added to the pulsed drive torque generated by the winding to provide an overall torque (M_{ges}) to the rotor which is essentially uniform during the entire revolution of the rotor.

3,891,906
VOLTAGE AMPLITUDE CONTROLLED REVERSING D.C. POWER CIRCUIT

Elester M. Crist, 3924 Anastasia St., San Diego, Calif. 92111

Filed Apr. 22, 1974, Ser. No. 462,664

Int. Cl.² H02P *7/06;* **H02P** *7/68*

U.S. Cl. 318—257 **10 Claims**

1. Voltage amplitude controlled reversing D.C. power circuit comprising:

a source of electrical power having a regularly pulsating voltage amplitude,

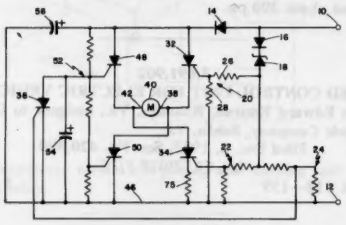
regulation means connected to said source of electrical power for passing D.C. power exceeding a predetermined voltage amplitude,

a polarity sensitive D.C. power utilization device having first and second input-output terminals,

first electronic switch means for connecting said first input-output terminal to said source of electrical power,

second electronic switch means for connecting said second input-output terminal to said source of electrical power,

first switch operator means connected to said regulation means for turning on said first electronic switch means



and turning off and holding off said second electronic switch means in response to said regulation means passing electrical power above a predetermined voltage level,

second switch operator means connected to said source of electrical power for turning on said second electronic switch means in response to voltage levels below said predetermined voltage amplitude.

3,891,907
ACTUATING MECHANISM FOR SLIDING DOORS

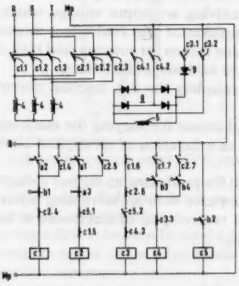
Dieter Lenzkes, Erlangen, and Karl-Heinz Seiler, Salz, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 8, 1973, Ser. No. 413,956

Claims priority, application Germany, Nov. 14, 1972, 2255780

Int. Cl. H02p *3/00*

U.S. Cl. 318—369 **8 Claims**



1. In an actuating mechanism for a sliding door, a linear motor including a slidable bar coupled to the door for moving the door into closed and open positions, a dual stator having the stacks thereof disposed on each side of the bar, ac and dc field windings disposed in the stator, for generating a traveling field for moving the bar and a braking field for reducing the velocity of movement thereof, respectively, and means coupled to the field windings, for energizing the windings and generating said fields, the improvement comprising:

first sequential switching means, coupled to said field winding energizing means and responsive to the movement and position of said slidable bar, including a first pair of contact switches disposed adjacent said door and each other for engaging said door, energizing said dc field winding and generating said braking field as said door is moved from one of said positions to the other by said traveling field; and

second sequential switching means, coupled to said field winding energizing means, and responsive to movement of said slidable bar, including a second pair of contact switches disposed adjacent said door and adjacent said first pair of contact switches, said first pair of switches being disposed between said second pair of switches, for engaging said door, deenergizing both said ac and dc field windings and terminating said braking and traveling fields when said door is moved by said bar into its closed and open positions.

3,891,908

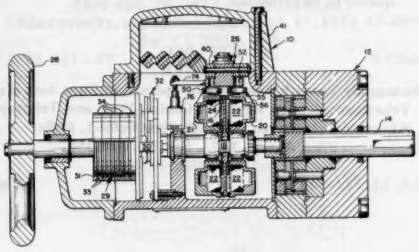
TORQUE SENSING DEVICE

Ruben J. Porras, 13215 S.E. 30th, Kirkland, Wash. 98004

Filed Oct. 10, 1973, Ser. No. 405,099

Int. Cl. G05d *17/02*

U.S. Cl. 318—434 **8 Claims**



1. In a motor having an output shaft, a rotor secured to the output shaft, at least one stator mounted concentric with the rotary axis of said output shaft, means for restricting rotation of said stator, and means for coupling the rotor and stator for rotating the rotor and thus driving the output shaft, a torque sensing device comprising means coupled to said stator rotation restricting means for sensing a reaction torque in said stator over a predetermined amount and first and second switch means coupled to said sensing means for performing a control function, said means for restricting rotation of said stator including a stationary member, a movable member pivotally secured to said stationary member, and first and second switch actuating members on said movable member and operable upon pivoting of said movable member in opposite directions due to oppositely directed increases in reaction torque to actuate said first and second switch means, respectively.

3,891,909

DOOR OPERATING CONTROLS

John Chase Newson, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., London, England

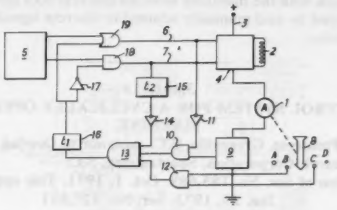
Filed May 29, 1973, Ser. No. 364,414

Claims priority, application United Kingdom, June 5, 1972, 26218/72

Int. Cl. G05d *3/08*

U.S. Cl. 318—469 **16 Claims**

1. A vehicle door operating apparatus comprising an electrical power source, an electric motor, an electrical threshold sensor connected in the circuit of said motor for sensing the occurrence of an abnormal magnitude of an electrical quantity corresponding to a loading of the motor in excess of a normal moving door loading and for producing an output signal in accordance therewith, an open and closed door control means, operable to cause the motor to drive the vehicle door in an opening mode towards an open position and, alternatively, in a closing mode towards a closed position, for, responsive to said output signal from said threshold sensor, changing the mode of operation of the apparatus, door position sensors located at points along the path of the door movement near to each end thereof, and a logic unit connected to



the output of said threshold sensor and to said door position sensors.

3,891,910

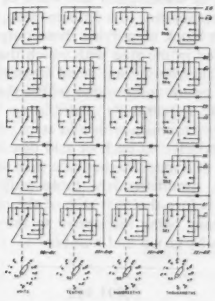
MACHINE TOOL MOTOR CONTROL WITH POSITION OFFSET

Tom T. Kumagai, Gardena; William C. Leone, Palos Verdes Estates; Michael May, Santa Monica; Harold L. Shoemaker, Manhattan Beach, and Roy A. Howard, Los Angeles, all of Calif., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Continuation of Ser. No. 598,525, Jan. 12, 1966, Pat. No. 3,609,497, which is a division of Ser. No. 827,981, March 10, 1959, Pat. No. 3,245,144. This application Sept. 16, 1971, Ser. No. 181,168. The portion of the term of this patent subsequent to Sept. 28, 1988, has been disclaimed.

Int. Cl. G05b *19/24*

U.S. Cl. 318—572 **3 Claims**



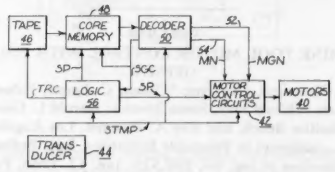
1. In a control system for positioning a controllable member to position a tool relative to a workpiece: an input signal system producing a group of discrete electrical signals in accordance with a fixed signal program based on a given assumed tool dimension; a discrete electrical signal producing system for producing discrete electrical signals each of which is indicative of a predetermined increment of displacement of said member; electrical comparator means receiving electrical signals from both said input signal system and said discrete electrical signal producing system and producing an electrical output when the signals of each system are different; electrically operated drive means receiving said electrical output and controlling said member; a manually adjustable discrete signal producing device selectively manually adjustable for registering a manually selected discrete tool offset value in accordance with the difference between the given assumed tool dimension on which the fixed signal program is based and an actual tool dimension; and means combining the discrete

signals of said adjustable device with the discrete signals of said input signal system to change the positioning of the member from that represented by the fixed signal program in accordance with the manually selected discrete tool offset value registered by said manually adjustable discrete signal producing device.

3,891,911
CONTROL SYSTEM FOR A CYCLICALLY-OPERATED MACHINE

Zane Frentress, Greenville, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 185,689, Oct. 1, 1971. This application Jan. 29, 1973, Ser. No. 327,511
Int. Cl. G05b 19/40
U.S. Cl. 318—696 **17 Claims**



1. A control system for a cyclically operated machine having a large number of outputs which are driven by a controlled number of incremental steps during each cycle comprising, in combination:

a. means for storing information in records which are made up of blocks of information, a record being provided for each cycle of information and each of the blocks of a record corresponding to a different step, said information within each block identifying those outputs which are to be controlled in the step with which the block is associated, and said information being arranged to identify the outputs by group and number within the group;

b. means for sequentially distributing the information blocks in synchronism with said steps; and

c. means responsive to each of said distributed blocks for identifying at a much higher rate than said steps and for controlling, simultaneously, those outputs identified in said block before the next step of the outputs, said controlling means being responsive to the identification of the outputs by group and number.

3,891,912
AUTOMATIC PULSE PHASE SHIFTER FOR A.C.-D.C. OR D.C.-A.C. CONVERTER

Atsumi Watanabe, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 21, 1973, Ser. No. 427,150
Claims priority, application Japan, Dec. 25, 1972, 47-129412
Int. Cl. H02m 1/08
U.S. Cl. 321—16 **5 Claims**

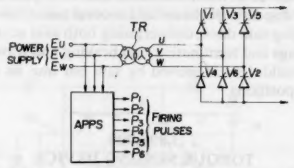
1. An automatic pulse phase shifter comprising:

an oscillator for producing an oscillation frequency in accordance with an input voltage applied thereto;

first means for dividing the oscillation frequency of said oscillator by a prescribed value and producing an output representative thereof;

second means, coupled to receive an A.C. voltage and the output of said first means, for producing an output representative of the phase difference between said A.C. voltage and the output of said first means;

third means for converting the output of said third means into a voltage to be applied to said oscillator in accordance with a signal applied thereto for maintaining a prescribed phase difference between the output of said oscillator and said A.C. voltage; and

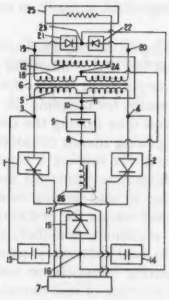


fourth means for producing firing pulses in accordance with the output of said first means and a control signal for regulating the phase at which said firing pulses are required to be produced.

3,891,913
INVERTER

Hattangady Vasanth Rao, and Ravindra Nath Doss, both of c/o Telecommunication Research Centre, Posts and Telegraphs Khurshid Lal Bhavan, Janpath, New Delhi-1, India

Filed Apr. 5, 1973, Ser. No. 348,354
Int. Cl. H02m 7/52
U.S. Cl. 321—45 R **1 Claim**



1. A parallel inverter comprising:

a transformer having primary, auxiliary and secondary windings closely coupled to each other, said secondary winding serving as AC output means, said primary winding divided into two equal portions, said two portions joined at a common centre point, said auxiliary winding divided into two equal portions, said two portions joined at a common centre point,

a D.C. source having a live terminal and a return terminal, the live terminal connected to the centre point of the said primary winding,

a pair of series connected first and second thyristors having their like terminals, such as cathodes or anodes, connected together and their remaining terminals, such as anodes or cathodes, connected across the said primary winding, an inductor connected between the junction of the said first and second thyristors and the return terminal of the D.C. source,

a pair of series connected first and second commutating capacitors connected across the said primary winding,

a third thyristor connected between the junction of the said commutating capacitors and the junction of the said first

and second thyristors, all three thyristors having their like terminals together,

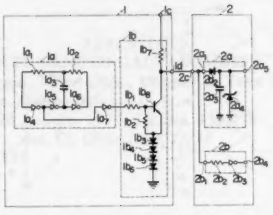
a pair of series connected diodes having their like terminals, such as cathodes or anodes connected together and their remaining terminals, such as anodes or cathodes, connected across the said auxiliary winding, with common centre point of the said auxiliary winding and the junction of the said diodes electrically bridged across the said third thyristor and said inductor in series, the conducting directions of the said diodes and the said third thyristor being same around the loop so formed, and

a control circuit to which the gates and cathodes of the said first, second and third thyristors are connected.

3,891,914
POWER AND SIGNAL TRANSMITTING MEANS

Sigeyuki Akita, Kariya, Japan, assignor to Nippon Soken, Inc., Nishio-shi, Japan

Filed Apr. 19, 1973, Ser. No. 352,615
Claims priority, application Japan, Apr. 21, 1972, 47-40792
Int. Cl. H02m *7/00*
U.S. Cl. 321—47 **9 Claims**



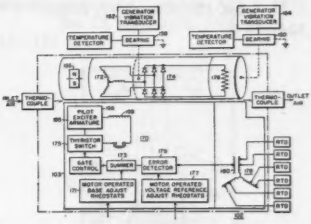
1. A power and signal transmitting means including a first circuit for sending out a transmitted signal of a given repetition frequency over a transmission line and a second circuit means connected to said first circuit through said transmission line for receiving the signal transmitted over said transmission line for reproducing said transmitted signal, said second circuit comprising a D.C. power voltage conversion circuit for rectifying said transmitted signal to produce a D.C. power voltage and a signal wave pickup circuit for receiving said transmitted signal to reproduce said transmitting signal.

3,891,915
DIGITAL COMPUTER CONTROL SYSTEM AND METHOD FOR MONITORING AND CONTROLLING OPERATION OF INDUSTRIAL GAS TURBINE APPARATUS TO DRIVE SIMULTANEOUSLY AN ELECTRIC POWER PLANT GENERATOR AND PROVIDE EXHAUST GASES TO AN INDUSTRIAL PROCESS

Robert A. Yannone, Aldan, and Roy W. Kiscaden, Springfield, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 189,632, Oct. 15, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,593
Int. Cl. F02c *7/26*
U.S. Cl. 322—15 **23 Claims**

1. A gas turbine electric power plant comprising a gas turbine having compressor, combustion and turbine elements, a generator having a field winding and being coupled to said gas turbine for drive power, a fuel system for supplying fuel for said gas turbine combustion elements, means for exciting said generator field winding, a control system including a digital computer and an input/output system therefor, a plurality of sensors disposed to monitor selected turbine parameters and to provide control system inputs representative thereof, means for operating said fuel system to energize said turbine and for controlling said exciting means, means continuously responsive to a control system output for modulating air flow into said compressor, and means for operating said computer to make control action determinations for implementation by

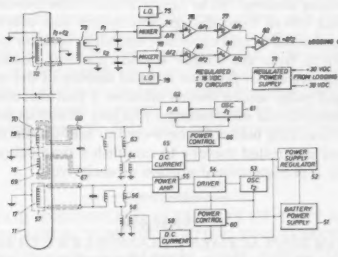


said fuel system operating means, said exciting means and said air flow modulating means, said modulating means control actions being determined in response to time varying combinations of said sensor inputs.

3,891,916
DUAL RADIO FREQUENCY MEASUREMENT OF DIELECTRIC CONSTANT AND RESISTIVITY OF BOREHOLE MEDIA

Richard A. Meador, Houston; Richard H. Arnold, Sugarland, and Hans J. Paap, Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,900
Int. Cl. G01v *3/10, 3/18*
U.S. Cl. 324—6 **23 Claims**



1. A method for determining the electromagnetic characteristics of materials in the vicinity of a well borehole, comprising the steps of:

generating, in a well borehole, a first, lower frequency, alternating electromagnetic field at a radio frequency in the range of approximately 10 to 20 megahertz;

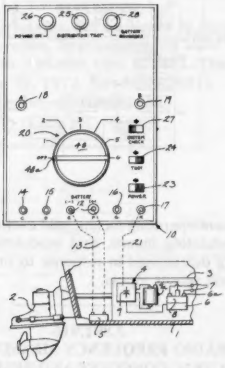
generating, in a well borehole, a second, higher frequency alternating electromagnetic field at a radio frequency in the range of approximately 20 to 40 megahertz said second frequency being a non-integer multiple of said first frequency;

detecting, in a well borehole, at a longitudinally spaced distance from the locations where said first and second alternating electromagnetic fields are generated, the voltage amplitudes of the total electromagnetic field at said first and second frequencies and generating signals representative of said total field voltage amplitudes; and recording said first field amplitude signals as a function of borehole depth.

3,891,917
CAPACITOR DISCHARGE IGNITION TESTING APPARATUS

Mark Harris, Brownsville, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 29, 1973, Ser. No. 346,158
Int. Cl. G01r *13/42, 23/00*
U.S. Cl. 324—16 R **36 Claims**



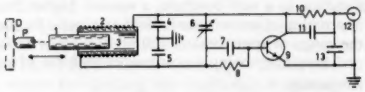
1. An ignition analyzing apparatus for analyzing the functioning of capacitor discharge ignition systems comprising an electronic pulse source means adapted to establish a plurality of time spaced pulses,

a selection means having a releasable connecting means for selectively connecting the output of said electronic pulse source means to an ignition system to provide timed trigger of said ignition system, and a portable spark gap means constructed to create a load corresponding to the load driven from the ignition system and adapted to be connected to said capacitor discharge ignition system and driven from the output of said capacitor discharge ignition system to produce a visual display of the operation, said pulse source means includes a first electronic oscillating circuit establishing a plurality of output pulses, and a switching means is connected to said oscillating circuit and controlled thereby to establish a time delayed signal for a predetermined portion of each cycle.

3,891,918
LINEAR DISPLACEMENT TRANSDUCER UTILIZING AN OSCILLATOR WHOSE AVERAGE PERIOD VARIES AS A LINEAR FUNCTION OF THE DISPLACEMENT

James F. Ellis, R.R. No. 2, Box 248, Powell, Tenn. 37849

Continuation-in-part of Ser. No. 127,319, March 23, 1971, abandoned. This application July 16, 1973, Ser. No. 379,567
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 D **18 Claims**



1. In an apparatus for measuring a dimensional quantity, in combination

a variable inductor comprising

an inductive coil,

means interfacing with a portion of the length of said coil, said means axially movable in a direction parallel to the axis of said coil, and varying the inductance of said coil as a square function of the relative axial displacement of said coil and said means interfacing, and

means mechanically coupling to the measured dimensional quantity and effecting said relative axial displacement;

a variable oscillator comprising in part

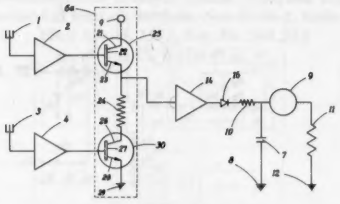
said variable inductor and controlled at least in part thereby, and producing a periodic output time-varying in proportion to said relative axial displacement; and

means receiving said periodic output and measuring the period thereof relative to a suitable reference, and yielding therefrom a measure of said dimensional quantity.

3,891,919
STORM-LIGHTNING DETECTOR

William Penninger, 1731 Cloverbrook Dr., Louisville, Ky. 40215

Filed Mar. 4, 1974, Ser. No. 447,888
Int. Cl. G01r *31/02*
U.S. Cl. 324—72 **7 Claims**



1. A storm and lightning detecting device comprising: radio receiver means to receive radio signals at at least two different frequencies including first radio frequency receiver means having tuning means to receive radio signals of first selected frequency and output means to provide first output signal in response to reception of radio signals at said first selected frequency and at least one second radio frequency receiver means having tuning means to receive radio signals of second selected frequency and output means to provide second output signal in response to reception of radio signal at said second selected frequency; at least one first switch means connected to said output means of said first radio frequency receiver means and actuated by receipt of output signal from said first radio frequency receiver; and second switch means connected to said output of said second radio frequency receiver and actuated by receipt of output signal from said second radio frequency receiver; and indication means responsive to simultaneous actuation of said first and second switch means to indicate reception by said radio receiver means of radio frequency signals at said first and second selected frequencies.

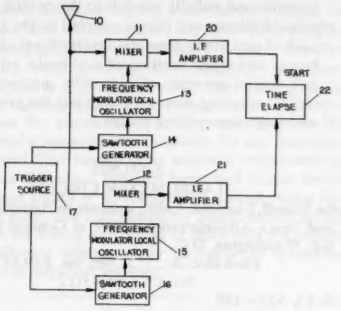
3,891,920
SCANNING MIXED BASE RECEIVER

Richard E. Williams, Fairfax, Va., assignor to Melphor Inc., Falls Church, Va.

Filed June 26, 1957, Ser. No. 668,255
Int. Cl. G01r *23/14*
U.S. Cl. 324—77 B **12 Claims**

1. A system of frequency measuring comprising a first frequency scanning system for capturing a predetermined frequency at a time within a first time interval wherein said time is a function of said frequency, and a second predetermined frequency scanning system for capturing said predetermined

frequency at a time within a second time interval which is a function of said predetermined frequency, and means for



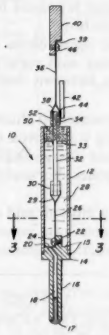
indicating the value of said predetermined frequency as a function of the difference of said times.

3,891,921

LIQUID DAMPED GALVANOMETER

Irvin L. Patterson, Tulsa, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.

Filed Jan. 31, 1974, Ser. No. 438,478
Int. Cl. G01r *1/14, 13/38*
U.S. Cl. 324—125 **9 Claims**



1. In a liquid damped galvanometer having:

a. a lower ribbon torsion spring fastened in a lower support rod;

b. a coil supported between two spools, the lower ribbon torsion spring fastened to the lower spool;

c. an upper ribbon torsion spring fastened at its lower end to the upper spool of said coil, and at its upper end to an upper support rod;

d. mirror means mounted to said upper spool; the improvement comprising;

e. damping liquid tubular means surrounding said lower torsion spring and said coil, and damping liquid in said tubular means; and

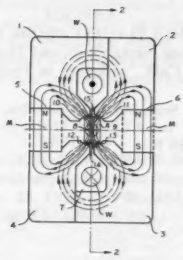
f. means to mount said mirror to said upper spool comprising; an epoxy cement including an inert, non-hygroscopic filler material.

3,891,922

PIVOTED ARMATURE INSTRUMENT FOR AN ELECTROMAGNETIC RECORDING SYSTEM

Wolfgang Atzinger, Munich, Germany, assignor to Fritz Schwarzer GmbH, Munich, Germany

Filed Feb. 14, 1974, Ser. No. 442,528
Claims priority, application Germany, Apr. 6, 1973, 231749
Int. Cl. G01r *1/16, 5/18*
U.S. Cl. 324—151 R **7 Claims**



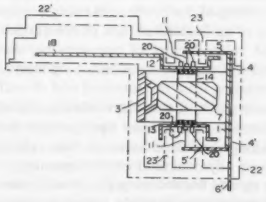
1. An electromagnetic rotational positioning device comprising a magnetically permeable support structure including a tubularly-shaped aperture, an unmagnetized but magnetically permeable armature rotatably mounted within said aperture, electrical conductor means disposed within said structure adjacent opposite boundaries of said aperture and substantially parallel to the axis of rotation of said armature, means for applying an electrical current to said electrical conductor means, said electrical conductor means being arranged to generate responsive to said current a control magnetic field permeating said armature in substantially the same directions at opposite sides of said rotatable mount and in directions orthogonal to said axis of rotation of said armature, and permanent magnet means disposed within said structure adjacent other opposite boundaries of said aperture for generating at least two permanent magnetic fields permeating said armature in substantially the same direction and in a direction orthogonal to said axis of rotation of said armature, said armature being arranged to rotate in response to inter-action of said control magnetic field with said permanent magnetic fields.

3,891,923

UNIT FOR ASSEMBLING ELEMENTS OF TAUT BAND SUSPENSION TYPE INDICATING INSTRUMENT

Takehiko Sakaguchi, Sakaki-machi, Japan, assignor to Hioki Electric Works Co., Ltd., Nagano, Japan

Filed Jan. 16, 1974, Ser. No. 434,761
Claims priority, application Japan, Feb. 2, 1973, 48-13480
Int. Cl. G01r *1/04*
U.S. Cl. 324—154 R **6 Claims**



1. A meter element assembling plate for taut band suspension type electrical indicating instruments comprising:

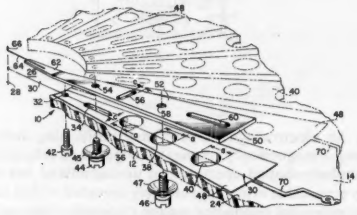
an insulating plate having apertures therein for coupling with other elements of the instrument;
a pair of metal plates fastened to said insulating plate in a spaced relation to one another;
a taut band suspending leaf spring connected to each of said metal plates; and
a terminal plate connected to each of said metal plates and extending outwardly therefrom.

3,891,924

ADJUSTABLE MULTI-POINT PROBE HEAD ASSEMBLY

Frank J. Ardezzone, Santa Clara, and Thomas A. Englert, San Jose, both of Calif., assignors to Probe Rite, Inc., Santa Clara, Calif.

Filed Sept. 10, 1973, Ser. No. 395,964
Int. Cl. G01r *31/02, 1/06*
U.S. Cl. 324—158 P **5 Claims**



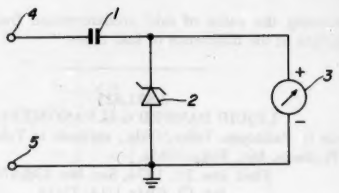
1. A multi-point electrical test probe head assembly for interface contact with miniature electronic devices to be tested, the assembly comprising, in combination:
a platform carrying an interconnect plug means for electrical interconnection with electronic test instruments;
a planar probe support member integrally coupled to the platform, said support member defining a central opening therein, a plurality of rows of individual openings within said support member, each row of openings being in a fixed pattern along a radial path line projecting from said central opening, at least one opening of each row of openings of the support member being oblong with the longitudinal axis in alignment with the central opening;
a plurality of elongated electrically conductive probe arms having a planar main part and an extension arm extending from one end of the main part, each probe arm being positioned with the planar main part thereof in overlapping engagment with the support member, the planar main part of each of the probe arms carrying a plurality of openings arranged in a row along the longitudinal axis of the probe arm and radial to the central opening, each row of openings including a first oblong slot, a second oblong slot and a pin engagement bore intermediate the first and second slots, the longitudinal dimension of the two oblong slots being at right angles relative to one another and the width of the slots being substantially less than the diameter of the mated openings of the board, each opening of the probe arm being in alignment with an opening of an associated row of openings of the board to establish related pairs of openings between each probe arm and the support member, a tip contact engaged to and extending from the terminal end of each of the extension arms, each of said tip contacts projecting to within said central opening, said tip contacts being positioned for making interface contact with electronic devices positioned adjacent said central opening;
fastening means for securing the planar main part of each of said probe arms in place and in abutment to said support member with each arm being secured about a row of openings along one of said radial paths, the fastening means including fastener pin means engaged through at least one pair of openings between the board and each probe arm including the pin engagement bore to secure the arm in place to the support member, said fastening means being free to move within the opening of the board laterally and radially relative to the central opening;
positional adjustment means coupled to the planar part of each of said probe arms and said platform of adjusting the lateral and radial position of said probe arms relative to said central openings of said probe support; and
electrical coupling means for coupling the probe arms with said interconnect plug means.

3,891,925

TACHOMETER CIRCUIT

John Dimeff, San Jose, Calif., assignor to National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Dec. 3, 1973, Ser. No. 420,812
Int. Cl. G01p *3/12*
U.S. Cl. 324—169 **5 Claims**



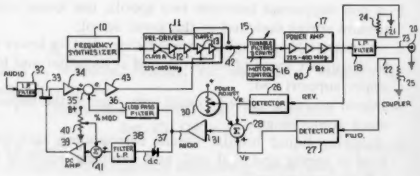
1. A tachometer circuit adapted for connection to a source of pulses, the frequency of said pulses being a direct function of the angular speed to be measured, consisting of:
first and second input terminals for receiving said pulses;
an unpolarized capacitor;
a zener diode, said zener diode and said capacitor being connected in series, said capacitor and said zener diode being connected between said first and second input terminals;
a d-c ammeter connected in shunt with said zener diode;
a fixed charge being transferred to said capacitor for each of said pulses, said charge being a function of the zener voltage of said zener diode and the capacitance of said capacitor;
said current flowing through said ammeter being dependent on only one variable, said pulse frequency, and thus said current being directly proportional to said speed.

3,891,926

FILTER MODULE

Neal H. Ishman, Springfield; Richard W. Lenert, Annandale, both of Va., and Jeffrey B. Goldman, Rockville, Md., assignors to American Standard, Inc., McLean, Va.

Filed Dec. 18, 1972, Ser. No. 315,818
Int. Cl. H04b *1/04*
U.S. Cl. 325—159 **12 Claims**



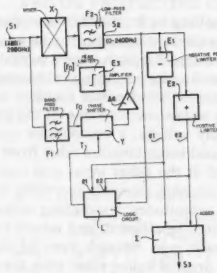
1. A multi-channel radio transmitter, comprising a source of radio frequency signal tunable over a band including plural megacycles, a predriver amplifier having a substantially equal

response over the entirety of said band, a band pass filter tunable over said band and having a narrow band width connected in cascade with said pre-driver amplifier, a broad band power amplifier connected in cascade with said filter, said broad band power amplifier having a substantially equal response over said band of frequencies, and an antenna coupled to said broad band amplifier, wherein said pre-driver amplifier and said broad band amplifier are transistor amplifiers, wherein said filter is a cavity resonator filter having plural resonant helix cavities coupled in cascade, and wherein is included means for automatically tuning said filter to the frequency of said source of radio frequency for any frequency in said band, said filter having three adjacent output settings for which phase difference between input and output terminals of said filter equals 0° in response to a single input frequency to said filter, and said means for automatically tuning includes means for setting said tuning to equal only the central one of said adjacent settings to the exclusion of remaining ones of said three adjacent settings.

3,891,927
PHASE CORRECTION DEVICE FOR DEMODULATION OF BIPOLAR SIGNALS

Rene Filaferro, Suresnes, and Francois Hebert, Villebon sur Yvette, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed July 19, 1973, Ser. No. 380,557
Claims priority, application France, July 19, 1972, 72.26068; Sept. 14, 1972, 72.32621
Int. Cl. H03d 1/02; H04b 1/16
U.S. Cl. 325—421 **12 Claims**



1. Apparatus for obtaining synchronous demodulation of a wave amplitude modulated by a rhythmic bipolar signal, by applying phase correction to a carrier frequency wave, said apparatus comprising:

means for supplying said carrier frequency wave;

demodulating means responsive to said modulated wave and to said carrier frequency wave for supplying a base-band bipolar signal;

first means responsive to the amplitude of said base-band bipolar signal for generating a first signal representative of the length of time between the instant that the amplitude of said base-band bipolar signal departs from a first peak-limiting level having a first polarity until said amplitude returns thereto;

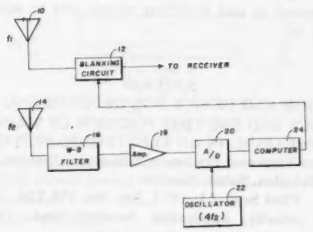
second means responsive to the amplitude of said base-band bipolar signal for generating a second signal representative of the length of time between the instant that the amplitude of said base-band bipolar signal departs from a second peak-limiting level having a second polarity until said amplitude returns thereto; and

a logic circuit comprising input circuit means for receiving said base-band bipolar signal, integrating means responsive to said input circuit means for integrating a signal applied thereto, and control means responsive to said first signal and to said second signal for controlling said input circuit means so as to allow the integration of said base-band bipolar signal during a time interval between a first intant when the amplitude of said base-band bipolar signal departs from said first peak-limiting level and a second instant when said amplitude arrives at said second peak-limiting level, and to exclude the integration of that portion of said base-band bipolar signal which departs from one of said peak-limiting levels and rearrives thereat without having reached the other peak-limiting level, the output signal of said integrating means being applied to said carrier frequency wave supplying means for controlling the phase of said carrier frequency wave.

3,891,928
VLF PHASE TRACKER WITH PHASE DISCRETION

Eric R. Swanson, 640 Silvergate Ave., San Diego, Calif. 92106

Filed Mar. 25, 1974, Ser. No. 454,183
Int. Cl.² H04B 1/10
U.S. Cl. 325—474 **5 Claims**



5. VLF phase tracker apparatus comprising first means for receiving incoming VLF signals at f_1, second means for receiving incoming VLF signals at f_2 simultaneously with said signals at f and including phase lock means, means for comparing the phase of individual cycles of said signals at F_2 with a reference track phase and for providing an output signal in response to a selectively predetermined phase difference, and blanking circuit means being responsive to said output signal to block said signals at f_1 from said first means for receiving signals at f_1.

3,891,929
ACOUSTIC SURFACE WAVE FREQUENCY SYNTHESIZER

Paul H. Carr, Bedford, and Alan J. Budreau, Arlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1974, Ser. No. 433,180
Int. Cl. H03b 19/00; H03h 7/10
U.S. Cl. 328—14 **7 Claims**

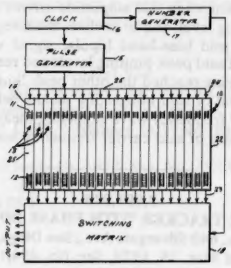
1. An acoustic surface wave frequency synthesizer comprising

a multiplicity of acoustic surface wave filters, each filter having an electromagnetic wave to acoustic surface wave input transducer and an acoustic surface wave to electromagnetic wave output transducer,

a pulsed source of electromagnetic wave energy connected to supply, simultaneously, electromagnetic wave pulses to each filter input transducer,

a system clock connected to said source of electromagnetic wave energy,

a switching matrix having an output and multiple inputs, each filter output transducer being connected to a separate switch matrix input, and



a switching matrix control means, said control means being connected to said switching matrix and to said system clock.

3,891,930

METHOD AND DEVICE FOR DETERMINING THE EXISTENCE AND THE TIME POSITION OF MAIN PEAKS APPEARING IN AN ELECTRONIC SIGNAL

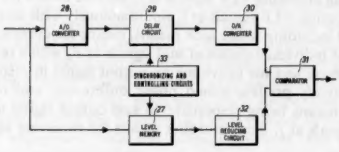
Erling Olav Valdemar Petrusson, Sollentuna, Sweden, assignor to AB Teleplan, Solna, Sweden

Filed Sept. 13, 1973, Ser. No. 396,724

Claims priority, application Sweden, Sept. 15, 1972, 11988/72

Int. Cl. H03k *5/18, 5/20*

U.S. Cl. 328—117 **7 Claims**



1. In a method of determining the existence and the time position of main peaks appearing in an electrical signal by comparing the amplitude of said signal with a variable reference level, called the cut-off level, an improved method for processing such signal, comprising:

dividing the signal to be examined into consecutive time intervals;

allocating a cut-off level to each of said time intervals, the amplitude of said cut-off level being based upon an analysis of measurements performed on the amplitude of the signal in the corresponding interval and in a number of adjacent intervals;

generating allocated cut-off levels during each consecutive time interval thereby providing a variable cut-off level function for the electrical signal;

delaying said electrical signal for a time equal to the time required to generate said cut-off level function; and

comparing the amplitude of the delayed signals with the cut-off level function to detect the presence, in the signal, of a main peak whose time position can then be determined.

3,891,931

CONTROL SYSTEM FOR SWITCHING ELEMENT

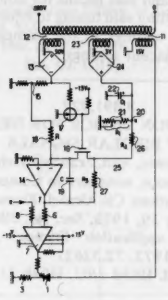
Marcel Nougaret, Seyssinet, and Jean-Claude Belmonte, Echirolles, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM), France

Filed Sept. 29, 1972, Ser. No. 293,509

Claims priority, application France, Sept. 29, 1971, 71.35146

Int. Cl. G06g *7/18*

U.S. Cl. 328—127 **7 Claims**



1. Device for controlling by impulses, responsive to a control signal, a switching element operating by an on-off process and connected to a current supply having a periodic voltage, comprising rectifier means for rectifying said supply voltage, an integrator connected to receive said rectified supply voltage for providing the instantaneous value of the integral of a function of that supply voltage, a comparator connected to receive at one input said instantaneous value from the output of said integrator and at the other input said control signal, and applies to said switching element, according to the comparison of those two magnitudes, a switching order for opening or closing the switching element, and means for resetting said integrator, at each pass through zero of the periodic supply voltage, to an original value, other than zero, provided for compensating variations in the periodic voltage supply, the original value of said integrator being supplied by a second integrator which receives, at its input, said control signal, and further means for resetting said second integrator to zero at each pass through zero of the said function.

3,891,932

METHOD AND APPARATUS FOR SENSING AND CONTROLLING MOTION OF A MOVABLE MEMBER

Charles C. Conner, and William R. Price, both of Portland, Oreg., assignors to William R. Price, Portland, Oreg.

Filed July 19, 1973, Ser. No. 380,679

Int. Cl. H03k *5/20*

U.S. Cl. 328—147 **8 Claims**

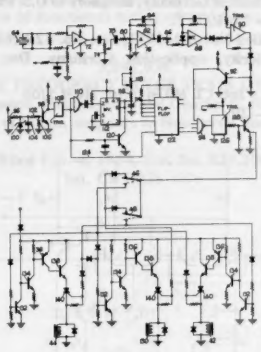
1. The method of sensing a predetermined motion of a movable member, comprising:

a. engaging the movable member with a transducer capable of converting noise signals to electric alternating current signals,

b. utilizing the electric alternating current signals to produce direct current motion signals proportional to the magnitude of motion of the movable member,

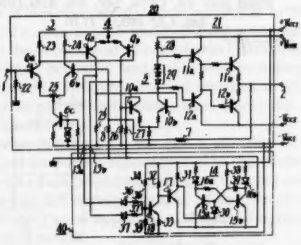
c. producing direct current control signals representing a predetermine condition of the movable member,

d. comparing the motion signals and control signals, and
e. utilizing said compared signals to produce a constant output electric sensing signal when said compared signals



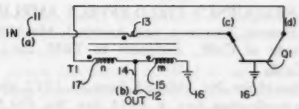
are matched, the magnitude of the output electric sensing signal being independent of the difference between the motion and control signals.

3,891,933
AMPLIFIER WITH SIGNAL CLIPPING INDICATOR AND/OR PROTECTIVE CIRCUIT
Tadao Suzuki, and Hirohito Kawada, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Feb. 4, 1974, Ser. No. 439,008
Claims priority, application Japan, Feb. 9, 1973, 48-17436
Int. Cl. G01r *21/00*; **H01f** *21/00*
U.S. Cl. 330—2 **9 Claims**



8. An amplifier with a signal clipping indication and/or a protective circuit comprising:
a. a voltage source;
b. a first differential amplifier having first and second transistors each having base, emitter and collector, the emitters of said first and second transistors being connected together and connected to one terminal of said voltage source through a common emitter impedance, the base of said first transistor being supplied with an input signal to be amplified;
c. first and second resistors each connected between the other terminal of said voltage source and each collector of said first and second transistors;
d. signal output means connected to at least one of said first and second resistors;
e. feedback means connected between said signal output means and the base of said second transistor so as to supply a feedback signal having the same phase and amplitude as said input signal supplied to the base of said first transistor; and
f. means for detecting an abrupt voltage change at one of said collectors of said first and second transistors and for producing a control signal when an unbalance exists between said input signal and said feedback signal whereby said control signal is indicative of a clipping state produced in said signal output means.

3,891,934
TRANSISTOR AMPLIFIER WITH IMPEDANCE MATCHING TRANSFORMER
David E. Norton, Framingham, Mass., and Allen F. Podell, Los Altos, Calif., assignors to Adams-Russell Co., Inc., Waltham, Mass.
Filed May 22, 1974, Ser. No. 472,281
Int. Cl. H03f *3/04*
U.S. Cl. 330—21 **8 Claims**

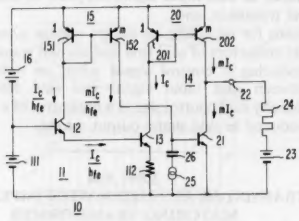


1. Amplifying apparatus comprising,
amplifying means having at least control, input and output electrodes,
a common terminal,
transformer means having at least a primary and a secondary winding,
said secondary winding having a tap intermediate to first and second portions thereof,
an input terminal,
an output terminal,
means for coupling said output terminal to said tap,
means for coupling said primary winding between said input terminal and said input electrode,
said first portion being coupled between said tap and said common terminal,
said second portion being coupled between said tap and said output electrode,
and means for coupling said control electrode to said common terminal.

3,891,935
TRANSISTOR BIASING ARRANGEMENT
Allen Leroy Limberg, Lambertville, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Sept. 21, 1973, Ser. No. 399,486
Int. Cl. H03f
U.S. Cl. 330—22 **25 Claims**

1. In combination:
first and second transistors of the same conductivity type, each having a base and an emitter electrode with a base-emitter junction therebetween, each having a collector electrode;
means for direct current conductively coupling said first transistor emitter electrode to said second transistor base electrode so a fixed portion of said second transistor base current will flow as said first transistor emitter current;
means for providing forward bias to the base-emitter junctions of said first and said second transistors, said means being connected between said first transistor base electrode and said second transistor emitter electrode;

a first current amplifier having an input circuit connected to said first transistor collector electrode, having an output circuit, and having an inverting current transfer characteristic between its said input and said output circuits; and utilization means connected to said second transistor collector electrode and connected to said first current amplifier output circuit.

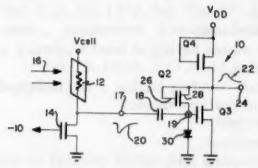


3,891,936

LOW FREQUENCY FIELD EFFECT AMPLIFIER

Donald E. Romeo, Torrance, and Archie J. MacMillan, Long Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 266,155, June 26, 1972, abandoned.
This application Aug. 5, 1974, Ser. No. 494,588
Int. Cl. H03f 3/16
U.S. Cl. 330—28 **12 Claims**



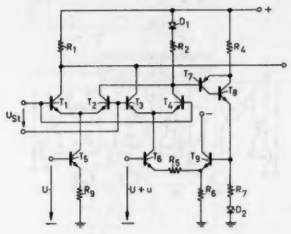
1. A field effect circuit comprising:
a silicon substrate;
a first MOS field effect device formed on said substrate and having a channel, with drain and source electrodes connected to said channel and a control gate associated with said channel;
load means connected in the drain-source external circuit of said device for developing output signals in response to gate voltage induced variations in the conductivity of said channel;
an integrated circuit capacitor formed as a metallized layer on a portion of said substrate, having one terminal connected to the control gate of said first MOS device and having the other terminal connected to a source of input signals to be amplified; and
dynamic feedback means coupled between the drain and the gate of said first MOS device for providing signal frequency negative feedback and biasing and stabilizing the operating point of said first MOS device;
said feedback means comprising a gate-to-drain connected second MOSFET device constructed and arranged to operate near the threshold current level and to thereby exhibit a dynamic resistance, for small signals, of the order of 10^9 to 10^{13} ohms;
whereby the frequency response characteristic of said circuit is characterized by a low frequency corner of the order of about 20 Hertz or less.

3,891,937

CIRCUIT ARRANGEMENT FOR ELECTRONIC GAIN/CONTROL, IN PARTICULAR ELECTRONIC VOLUME CONTROL CIRCUIT

Paul Bockelmann, Halstenbek, and Wilfried Aschermann, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,268
Claims priority, application Germany, Dec. 21, 1972, 2262580
Int. Cl. H03q 3/30; H03f 3/68
U.S. Cl. 330—29 **6 Claims**



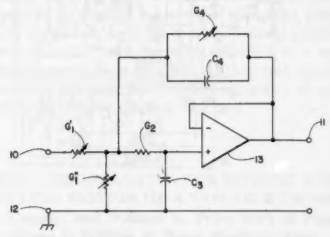
1. A gain control circuit comprising at least a first differential amplifier including first and second coupled transistors each having emitter, base, and collector electrodes; a signal transistor means coupled to said emitters for carrying direct and signal currents; means coupled to said bases for applying a gain control voltage thereto; means coupled to one of said collectors for deriving an output signal therefrom; and means for negatively feeding back at least said signal from the remaining collector to said signal transistor.

3,891,938

FUNCTIONALLY TUNABLE ACTIVE LOW-PASS FILTER

Wasfy Boushra Mikhael, Ottawa, and Lloyd Kenneth Keys, Carp, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed July 19, 1974, Ser. No. 490,108
Int. Cl.[2] H03F 1/36
U.S. Cl. 330—107 **2 Claims**



1. A functionally tunable active low-pass filter comprising input, output and common terminals;
a non-inverting essentially unity gain amplifier having its output connected to said output terminal;
first and second resistors serially connected between said input terminal and the input of said amplifier;
a first capacitor connected between the input of said amplifier and said common terminal;
a second capacitor and a third resistor connected in shunt between the output of said amplifier and the junction of said first and second resistors;

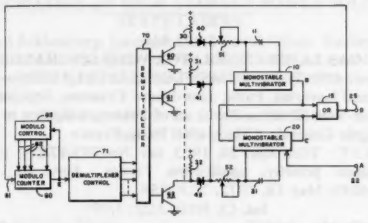
the amplifier, resistors and capacitors coacting such that variations in resistance of the second resistor connected to the input of the amplifier affects only the pole resonant frequency ω_p and the pole quality factor Q_p, and variations in resistance of the third resistor affects only the pole quality factor Q_p, thereby enabling a unidirectional sequence of functional tuning of said filter.

3,891,939

VARIABLE FREQUENCY PULSE TRAIN GENERATOR

David B. Bennett, Minneapolis, and Charles P. Harman, Roseville, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Feb. 4, 1974, Ser. No. 439,200
Int. Cl. H03b *3/04*
U.S. Cl. 331—1 A **6 Claims**



1. A variable frequency pulse train generator comprising:

an astable free-running multivibrator including first and second monostable multivibrators, each adapted to provide an output pulse of predetermined width in response to application of a pulse at its respective inputs, said predetermined pulse width being a function of the parameters of the timing network associated with the monostable multivibrators;

a plurality of resistors, each of different value, each of said resistors having a first end connected to a source of potential and a second end connected through a diode to the timing networks of the two monostable multivibrators;

a plurality of switching means equal in number to the plurality of said resistors, each said switching means adapted to connect the second end of one of said resistors to a point of reference potential and each said switching means being operable through a control terminal to disconnect said second end of said resistor from said point of reference potential; and

control means having an input and a plurality of outputs, one of said outputs being connected to the control terminal of each of said switching means to connect one of said resistors into the timing networks of the two monostable multivibrators upon application of a signal to the input of said control means.

3,891,940

TWO-TONE GENERATOR USING TRANSISTORS FOR SWITCHING LC RESONANT CIRCUITS

Kouichi Sekiguchi, Asaka, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

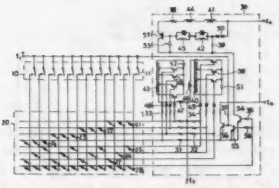
Filed Feb. 6, 1974, Ser. No. 439,985
Claims priority, application Japan, Feb. 10, 1973, 48-16119; Sept. 21, 1973, 48-105951
Int. Cl. H03b *5/12;* **H04m** *1/50*
U.S. Cl. 331—48 **3 Claims**

1. A two-tone genera r for producing a dial tone in the form of two-tone signal, comprising:

a two-tone oscillator having two LC resonance circuits each composed of a primary coil and a secondary coil and a capacitor in parallel with said secondary coil;

a plurality of switching transistors having the collector-emitter paths thereof coupled between corresponding taps along respective ones of said secondary coils and said capacitors to switch the values of the inductances of the secondary coils in response to turning-ON of ones of said switching transistors;

a plurality of switches individually controllable and each having a contact operable to an open and a closed condition;



a matrix connected to the contacts of the switches for providing outputs corresponding to closed contacts of the switches; and

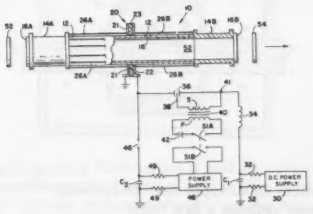
biasing means electrically coupled to said matrix and said switching transistors for biasing the bases of respective selected ones of said switching transistors of the two LC resonance circuits with base currents sufficient to turn-ON said selected ones of said switching transistors in response to said outputs of the matrix.

3,891,941

IMPLODING CYLINDER METAL VAPOR LASER

Thomas G. Roberts; Thomas A. Barr, Jr., and Charles M. Rust, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,580
Int. Cl. H01s *3/22, 3/09*
U.S. Cl. 331—94.5 G **7 Claims**

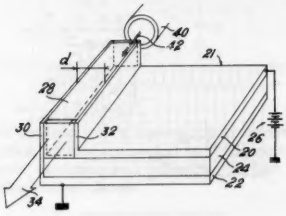


1. A metal vapor laser comprising: a glass tube, a metal coating around the inner surface of said tube, first and second cylindrical electrodes at respective ends of said tube, said electrodes being disposed coaxial with said tube and in contact with the ends of said metal coating for conducting electrical current through the metal coating therebetween, first and second optical windows covering respective ends of said electrodes, pumping means coupled to said electrodes for coupling electrical energy thereto and through said metal coating for vaporizing said metal, and for producing a population in said vapor, and means for stimulating the emission of a laser beam therefrom.

3,891,942
METHOD OF PUMPING FOR A LASER AND DEVICE FOR CARRYING OUT SAID METHOD

Michel Clerc, Limours, and Paul Goujon, Chennevieres-sur-Marne,, France, assignors to Commissariata l'Energie Atomique, Paris, France

Filed Sept. 11, 1973, Ser. No. 396,177
Claims priority, application France, Sept. 24, 1972, 72.33492
Int. Cl. H01S 3/09
U.S. Cl. 331—94.5 G 8 Claims

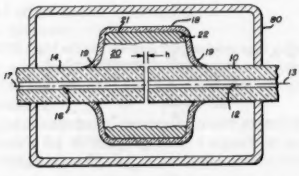


1. A method of pumping for a gas laser which consists in exciting a gas contained in a passage and discharging a structure for storage and propagation of electrical energy in such a manner as to ensure that the excitation wave is progressive and travels along the axis of said passage in a direction parallel to the stimulated radiation and at a velocity in the vicinity of the velocity of said radiation, wherein said discharge is initiated by injecting an electron beam into said passage in a direction parallel to its axis at a velocity in the vicinity of the velocity of said radiation in said gas.

3,891,943
LONG LIFE HELIUM METAL VAPOR LASER

Mark W. Dowley, Palo Alto, and William A. Shull, Portola Valley, both of Calif., assignors to Liconix, Mountain View, Calif.

Filed Aug. 6, 1974, Ser. No. 495,222
Int. Cl. H01s 3/22, 3/09
U.S. Cl. 331—94.5 G 13 Claims

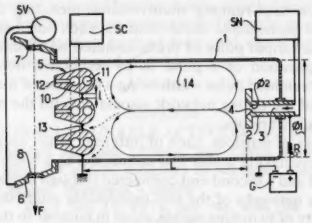


1. A helium metal vapor laser comprising:
a first tube defining a first bore;
a second tube disposed along an axis common to said first tube and defining a second bore, adjacent ends of said first and second tubes being closely spaced relative to one another so as to form a narrow opening therebetween;
a third tube coaxial with said first and second tubes and having end walls which are joined to said first and second tubes such that the internal surface of said third tube and the outer surfaces of the enclosed portions of said first and second tubes form a reservoir, the inner diameter of said third tube being greater than the outer diameter of said first and second tubes near said adjacent ends;
a mass of metal disposed within said reservoir, said metal forming a coating on said internal surface away from said bores and said narrow opening;
a cathode structure coupled to the end of said first tube opposite said narrow opening and including a cathode;
an anode structure coupled to the end of said second tube opposite said narrow opening and including an anode, said cathode structure, said anode structure, and said first, second and third tubes forming a sealed envelope; and
helium gas filling said envelope for substaining a discharge through said first and second tubes between said anode and said cathode, said narrow opening serving to effectively confine said discharge within said bores so as to inhibit its direct contact with said metal, said end walls and said third tube serving to conduct discharge produced heat to said metal, and said first and second tubes serving to radiate and convect discharge produced heat to said metal, thereby indirectly heating said metal in a manner such that a substantially uniform rate of the metal vaporizes and diffuses through said narrow opening into said first and second bores.

3,891,944
GAS LASER GENERATOR WITH DISCHARGE CONTAINER GAS FLOW CIRCULATION

Bernard Lavarini, Paris; Jean-Pierre Crancon, Arpajon, and Jean-Yves Thomas, Paris, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Apr. 20, 1973, Ser. No. 353,174
Claims priority, application France, Apr. 20, 1972, 72.14049; May 18, 1972, 72.17856
Int. Cl. H01s 3/22, 3/09
U.S. Cl. 331—94.5 G 3 Claims



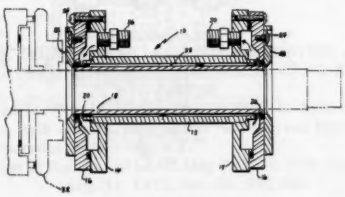
1. A gas laser generator comprising:
an extended container,
a plurality of equally, laterally spaced, transversely aligned aerodynamically profiled gas injectors positioned within said container adjacent a first end thereof and forming with said container transfer openings at said first end,
an injection pipe opening into said container close to its second end for supplying said container with at least one jet of a first gas capable of being excited by an electric discharge,
longitudinally spaced electrodes disposed in the container at respective ends for producing an electrical discharge in the first gas,
an extended expansion chamber connected to the first end of the container and increasing in diameter progressively from the first end of the chamber adjacent the container to its second end,
evacuation means for maintaining the second end of the expansion chamber at low pressure and for circulating the first gas from the injection pipe through said extended container and into the expansion chamber by way of the transfer openings,
said profiled gas injectors including gas discharge nozzles facing into the expansion chamber and supplied with at least one second gas capable of being excited by molecular interaction with the first gas in its excited state and being downstream of said electrical discharge, so as to cause the first and second gases to mix,

a cavity capable of amplifying a laser emission in the presence of the second gas in its excited state; said cavity being arranged in the expansion chamber in such a manner as to be traversed by the gaseous mixture downstream of said nozzles, said generator being characterized in that the dimensions of the container, the diameter and position of the injection pipe, the injection rate of the first gas and the dimensions of the transfer openings are such as to produce a whirling flow movement of the first gas longitduinally throughout said container, upstream of said nozzles with a first, inner flow portion extending longitudinally from the second end to the first end, between said electrodes, and at least one second flow portion radially outwards of the first flow portion reversed thereto near the sidewalls of said container.

3,891,945
CONFIGURATION FOR EFFICIENT COOLING AND EXCITATION OF HIGH AVERAGE POWER SOLID STATE LASERS

Howard Schlossberg, Lexington, and David Milam, Burlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 20, 1973, Ser. No. 399,012
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 P **7 Claims**



1. A system for cooling and exciting high average power solid state lasers comprising: a hollow thin walled cylindrically shaped, solid state lasing medium; a coolant; a coolant containing means surrounding the exterior wall of the lasing medium and sealed thereto; a housing mounted in a sealed relationship to the interior wall of the lasing medium and at one end thereof; a housing extension mounted in a sealed relationship to the interior wall of the lasing medium and at the end remote from the said housing; removably attachable means in the housing and the housing extension for exciting the lasing medium, and means in the housing and housing extension for directing the flow of a coolant around the exciting means and lasing medium.

3,891,946
VARIABLE FREQUENCY OSCILLATOR INCLUDING ACTIVE BAND-PASS FILTER WITH POSITIVE FEEDBACK

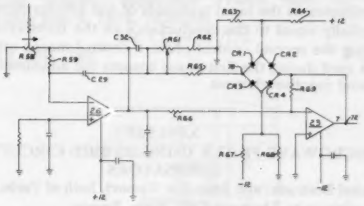
John L. Aker, Chanute, Kans., assignor to Kustom Electronics, Inc., Chanute, Kans.

Division of Ser. No. 222,524, Feb. 1, 1972, Pat. No. 3,812,278.
This application Mar. 20, 1974, Ser. No. 452,709
Int. Cl. H03b *5/20*
U.S. Cl. 331—108 D **2 Claims**

1. A low distortion sinusoidal oscillator circuit comprising: an active inverting band pass filter having an input and an output,

inverter means for generating a positive feedback signal, said inverter means having an output and an input interconnected with said inverting band-pass filter output,

a feedback loop having an input and an output, the feedback loop input interconnected with said inverter means output and said feedback loop output interconnected with said active band-pass filter input, said feedback loop having a means for limiting the amplitude of said positive



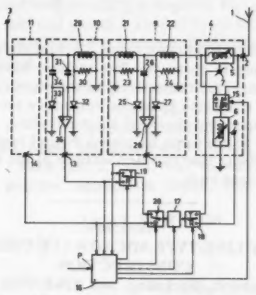
feedback signal, the limiting means comprising a clipping circuit interconnected between said inverter means output and said filter means input, and

a means for adjusting the center frequency of said active band-pass filter, the adjusting means consisting of a single resistive element.

3,891,947
CIRCUIT ARRANGEMENT FOR ADAPTING A LOAD NETWORK TO A TRANSCEIVER

Jean-Pierre Debost, Versailles, and Jacques Mezan de Malartic, Antony, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,403
Claims priority, application France, Oct. 31, 1972, 72.38590
Int. Cl. H03h *7/40*
U.S. Cl. 333—17 **6 Claims**



1. An arrangement for adapting a load network to a transceiver, comprising a load adaptor having a first and a second adjustable reactive element, switching means and at least a first and a second control means in which in the presence of a first information indicating at least the fact that the resistance of the load network is higher than that of the transceiver, the switching elements connect the first reactive element in series with the load network which is connected in parallel with the second reactive element and permit the second control means to vary the susceptance of the second reactive element during a first control phase until the real part of the impedance at the input terminal of the arrangement is substantially equal to the resistance of the transceiver, while during a second control phase a control means other than that used during the first control phase ensures the adjustment of the first reactive element, whereas in the presence of a second information indicating at least the fact that the conductance

of the load network is higher than that of the transceiver the switching elements connect the second reactive element in parallel with the combination of the first reactive element which is in series with the load network and permit the first control means to vary the reactance of said first reactive element during the first control phase until the real part of the admittance at the input terminals of the arrangement is substantially equal to the conductance of the transceiver while during the second control phase a control means other than that used during the first phase ensures the adjustment of the second reactive element.

3,891,948
MICROWAVE FILTER USING HYBRID CIRCUIT AND RESONATORS

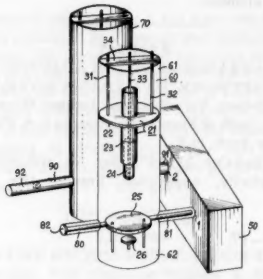
Michel Destrade, and Jean-Luc Vassort, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 25, 1974, Ser. No. 482,984

Claims priority, application France, June 29, 1973, 73.24002

Int. Cl. H01p *1/20*

U.S. Cl. 333—73 W **4 Claims**



1. A branching filter comprising: a hybrid circuit having two pairs of conjugate ports; two line sections having respective first ends connected respectively to the ports of one and the same pair of conjugate ports and respective second ends one of which is open and the other short-circuited; and two resonators tuned to the same frequency F_o and respectively coupled in parallel to said two line sections at the same distance from said second ends.

3,891,949
SLIT LINE-TYPE MICROWAVE CIRCUIT CONSTRUCTION

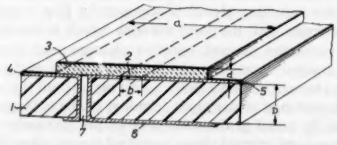
Jurgen Marquardt, Backnang, and Erich Pivit, Allmersbach Im Tal, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Nov. 27, 1973, Ser. No. 419,294

Claims priority, application Germany, Nov. 30, 1972, 2258594; Nov. 30, 1972, 438665[U]

Int. Cl. H01p *3/02, 3/08*

U.S. Cl. 333—84 R **7 Claims**



1. In a circuit device including a dielectric carrier substrate having a relatively low dielectric constant ϵ_{r1} and a first metal layer on one surface side for forming a symmetrical microwave line, the improvement wherein said line is in the form of a slit line, said device comprises

a. a dielectric plate bonded to said first metal layer and covering the side of said line which faces away from said substrate; the dielectric constant ϵ_{r2} of said dielectric plate being relatively high and having a value of at least 8;

b. a second metal layer disposed on the side of said substrate facing away from said slit line, said second metal layer defining an asymmetrical strip line;

c. means defining a bore extending through said substrate between its side carrying said slit line and its side carrying said strip line; and

d. a third metal layer disposed on the walls of said bore and coupling said lines together.

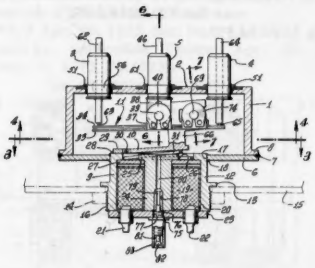
3,891,950
PRESSURIZED RELAY ASSEMBLY

Victor E. De Lucia, 927 Euclid Ave., Santa Monica, Calif. 90403

Filed Aug. 5, 1974, Ser. No. 494,825

Int. Cl.² H01H *1/66*

U.S. Cl. 335—151 **16 Claims**



1. A high voltage double pole, double throw relay assembly comprising: a metal housing, normally open contact means and normally closed contact means in said housing including terminals projecting from said housing, electromagnetic operating means for closing and opening said contact means upon energization and deenergization of said electromagnetic operating means, means forming a seal between said terminals and said housing, and means for admitting a pressurized dielectric gas into said housing, said means forming a seal including insulators on said terminals, first sealing members sealingly affixed to said insulators, and other sealing members sealingly affixed to said housing and to said first sealing members and said terminals.

3,891,951
DEVICE FOR THE DISPLAY OF COLOUR TELEVISION IMAGES

Tjitte Talsma, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,909

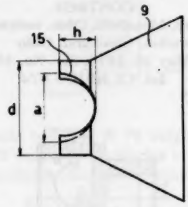
Claims priority, application Netherlands, Mar. 19, 1973, 7303773

Int. Cl. H01t *7/00*

U.S. Cl. 335—210 **8 Claims**

1. A device for the display of colour television images, comprising a cathode-ray tube of the shadow mask type having a rearmost cylindrical part in which a plurality of electron guns are arranged for generating a plurality of electron beams which are situated substantially in one plane, and a foremost flared part, the said device furthermore comprising a deflection system which is coaxially arranged about the tube near the transition between the two parts of the tube and which essentially comprises an annular ferromagnetic core having a

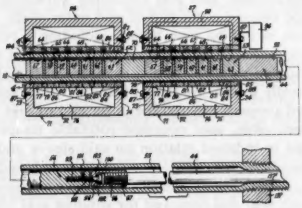
cylindrical rear section, a first deflection coil system for deflecting the electron beams in a first deflection direction perpendicular to the tube axis and in the said plane, and a second deflection coil system for deflecting the electron beams in a second deflection direction perpendicular to the tube axis and to the said plane, the said deflection system being adapted such that the second deflection coil system generates a magnetic field which has a cushion-like shape near the rear of the deflection system and a barrel-like shape near the front, characterized in that the rear of the ring core has recesses in two diametrically situated locations, the connecting line between the recesses being substantially situated in the plane of the electron beams, said recesses having a depth at least equal to half the length of the rear section.



3,891,952
ELECTROMAGNETIC ASSEMBLY RESISTING AXIAL ARMATURE MOVEMENT FOR WORKING OR FINNING TUBING

Richard M. Winter, Mentor, and William F. Aylard, Northfield, both of Ohio, assignors to Non-Ferrous International Corporation, New York, N.Y.

Division of Ser. No. 141,249, May 7, 1971. This application Aug. 21, 1973, Ser. No. 390,240
Int. Cl. H01f 7/08
U.S. Cl. 335—258 **7 Claims**

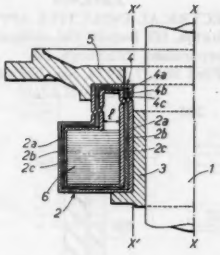


1. Magnetic apparatus for resisting axial movement of an armature within a non-magnetic tube extending through the magnet comprising, in combination:
- an annular magnet assembly having a generally centrally located opening extending through the assembly;
- the tube extending through the opening and beyond ends of the magnet assembly;
- an armature of a diameter smaller than and within the tube; flux producing means to create magnetic flux in said magnet; and
- cooperating pole piece means on said magnet assembly and magnetic material means on said armature for causing magnetic flux to enter and leave said armature at multiple locations along the armature, so that axial displacement of the armature with respect to the magnet assembly is effectively resisted.

3,891,953
HIGH HOLDING STRENGTH AND LOW RESPONSE TIME ELECTRO-MAGNET STRUCTURE

Georges Thomin, Ramonville, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Apr. 2, 1974, Ser. No. 457,212
Claims priority, application France, Apr. 3, 1973, 73.11920; Jan. 4, 1974, 74.00306
Int. Cl. H01f 7/20
U.S. Cl. 335—289 **9 Claims**

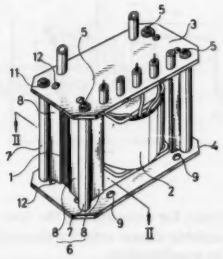


1. An electro-magnet apparatus for attracting a load comprising:
- a shaft;
- an armature adapted to support a load and formed of a plurality of electrically insulated magnetic plates arranged concentrically of said shaft and fitted one into another, the armature plates being made of a high saturation induction material;
- a core formed of a plurality of electrically insulated magnetic plates arranged concentrically of said shaft and fitted one into another, the core plates being made of a high saturation induction material, said core disposed in axially spaced relation to said armature; and
- an energizing coil means disposed in cooperating relation to said core for generating a magnetic flux therein, whereby when said coil means is excited by an electrical current a large attraction force having a short response time will be generated.

3,891,954
TRANSFORMER

Iseo Konishi, Nilchi Seisakusho 4-49-Chome, Osaka, Japan

Filed Jan. 2, 1974, Ser. No. 429,766
Claims priority, application Japan, Dec. 29, 1972, 47-482171
Int. Cl. H01f 27/26
U.S. Cl. 336—61 **12 Claims**



1. A transformer device comprising:
- a. a core on which a coil is wound;
- b. a plurality of setting plate means each setting plate means approximately equal in length to the height of the core, each said setting plate means including two setting surface means forming a substantially right angle, wherein each said setting plate means engaging only one corner of

said core with said setting surface means pressing against the respective core edges, and thereby firmly holding said core in place; and,

c. two end plate means respectively arranged on the top and bottom of said core, for securely setting the top and bottom ends of said plurality of setting plate means, said end plate means having means for independently adjusting the position of each of said setting plate means for accommodating different size cores.

3,891,955

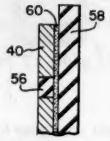
ELECTRICAL INDUCTIVE APPARATUS

William E. Horton, III, Bogart, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1974, Ser. No. 467,756

Int. Cl. H01f *27/30*

U.S. Cl. 336—205 **1 Claim**



1. A transformer comprising:

a magnetic core;

a primary winding disposed in inductive relationship with said magnetic core;

a secondary winding having a plurality of conducting layers disposed in inductive relationship with the magnetic core, with each of said conducting layers comprising at least two metallic foil conductors which are bonded to a common layer of insulating material; and,

an insulating member positioned between the foil conductors, with said insulating member having substantially the same radial thickness as the foil conductors.

3,891,956

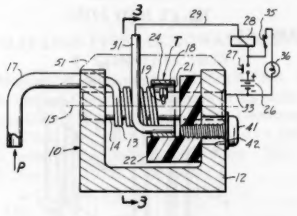
APPARATUS FOR MEASURING VARIABLES

James G. Allemann, Santa Ana, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Nov. 19, 1973, Ser. No. 417,338

Int. Cl. H01h *37/10*

U.S. Cl. 337—1 **17 Claims**



1. In apparatus for determining the state of a fluid by measuring two variable characteristics thereof, the improvement comprising, in combination:

first means for expressing one of said variables in terms of a first change of position;

second means for expressing the other of said variables in terms of a second change of position;

third means operatively associated with said first and second means for deriving from said first and second changes of position an indication of the relative displacement of said first and second changes of position with respect to each other; and

fourth means connected to said first means for combining a third change of position with said first change of position to modify the operation of said measurement deriving means.

3,891,957

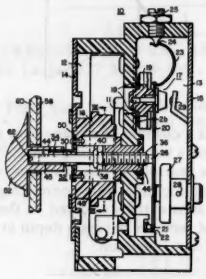
REFERENCE CORRECTABLE TEMPERATURE CONTROL

Calvin J. Holtkamp, Mansfield, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed May 10, 1974, Ser. No. 468,708

Int. Cl. H01h *37/14*

U.S. Cl. 337—347 **6 Claims**



1. In a control of the type having a casing with a snap-acting, overcenter mechanism therein for operating cycling switch contact means, and in which positioning of a fulcrum controls the operating point of said overcenter mechanism;

a rotatable hollow outer shaft, having an inner end and a headed outer end, threadably carried in said casing and axially movable in accordance with rotation of the outer shaft;

a rotatable rod threadably carried in said outer shaft and having an inner end projecting beyond said inner end of said outer shaft to serve as said fulcrum of said overcenter mechanism, said rod extending outwardly well beyond said headed outer end of said outer shaft;

circuit switching cam means including a recess receiving said headed outer end of said outer shaft in rotationally coupled relation, said cam means also including an outwardly projecting sleeve through which said rod extends and projects beyond the outer end of said sleeve;

a removable, user operated rotatable temperature setting dial in indexed relation on said sleeve and covering the outer ends of said sleeve and said rod; and

means on the outer end of said rod for engagement by a tool with said dial removed for rotating said rod to shift said rod axially relative to said outer shaft and to thereby recalibrate said control by changing said fulcrum position relative to the rotative position of said dial and sleeve.

3,891,958

HUMIDITY SENSOR

Takashi Wakabayashi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 2, 1973, Ser. No. 384,936

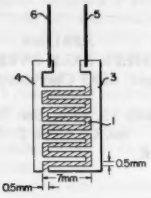
Claims priority, application Japan, Sept. 20, 1972, 47-94737

Int. Cl. H01c *13/00*

U.S. Cl. 338—35 **6 Claims**

1. A humidity sensor comprising (1) a humidity sensitive film which consists essentially of a reaction product obtained by heating (a) a chlorine containing polymer selected from the group consisting of a chlorinated natural rubber, polyvinyl

chloride, polyvinylidene chloride, chlorinated polyethylene and chlorinated polypropylene and (b) a polyamide resin, the reactive proportion of said chlorine containing polymer and

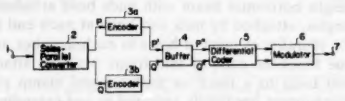


said polyamide resin being 45 to 90 weight % of polyamide resin and 10 to 55 weight % of chlorine containing polymer, and (2) two electrodes applied to said humidity sensitive film.

3,891,959
CODING SYSTEM FOR DIFFERENTIAL PHASE MODULATION

Yoshikazu Tsuji, and Yukio Sohma, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1973, Ser. No. 429,156
Claims priority, application Japan, Dec. 29, 1972, 48-1508
Int. Cl.[2] G06F *11/12*
U.S. Cl. 340—146.1 AQ **19 Claims**



1. A coding system for a differential phase modulation system for coding an input, serial bit signal into a signal including an error correcting code, and wherein each successive, predetermined number of bits of the thus coded signal defines a respectively corresponding symbol, and the phase of a carrier is shifted in accordance with each successive symbol, said coding system comprising:

series-to-parallel converter means for receiving and converting an input, serial bit signal into parallel, serial bit signals,

encoder means for receiving the parallel signals from said converter means and encoding each of the parallel signals with respectively corresponding error correcting codes, and producing corresponding, parallel coded signal outputs,

buffer means for receiving the parallel, coded signals from said encoder means and selecting a predetermined number of bits in alternate succession from each thereof, each said predetermined number of bits defining a corresponding symbol, and said buffer means providing the thus defined symbols in serial succession as an output.

3,891,960
DOPPLER SONAR SYSTEM

Maurice W. Widener, Austin, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1970, Ser. No. 15,322
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 R **8 Claims**

1. A system for acoustic echo ranging capable of measuring bearing range and velocity of moving targets; comprising:

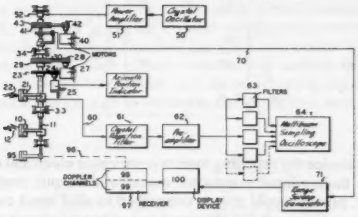
a. a first sound transducer rotatably mounted;

b. a second transducer rotatably mounted, said first and second transducers forming a rotating directional acoustic array;

c. a signal source for generating a first substantially pure sine wave signal coupled to said first sound transducer;

d. a means for receiving and amplifying signal echoes of a given frequency above or below said first signal received from a moving target coupled to said second sound transducer;

e. means for comparing the frequencies of the transmitted signal and the echo signal and converting the difference



to target velocity, said means coupled to said signal source and said receiving means;

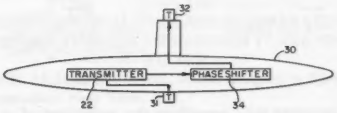
f. means of measuring range on the said received signal by measuring the delay of the signal related to the rotation speed and position of said first rotating sound transducer; and

g. means for producing a signal capable of both frequency resolution and time resolution using as a reference the rotating directional acoustic array.

3,891,961
SONAR COUNTERMEASURE

Rudolph M. Haisfield, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1961, Ser. No. 92,101
Int. Cl.[2] H04B *11/00*
U.S. Cl. 340—5 R **11 Claims**

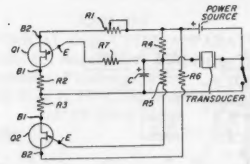


1. A sonar countermeasure comprising, a first and second sonar transducer, a broadband source of signals coupled to each of said transducers, said transducers being rigidly interconnected and separated by a plurality of wavelengths at the lowest frequency within the band of said source, and continuously variable phasing means to adjust the frequency of the signal supplied to each of said transducers to a different value differing by less than 1 cycle per second.

3,891,962
ELECTRONIC INSECT CONTROLLER

Herbert Montgomery White, Carleton Place, Canada, assignor to Tritronics (1971) Ltd., Weston, Canada

Filed Oct. 10, 1972, Ser. No. 296,049
Claims priority, application Canada, Oct. 7, 1971, 124720
Int. Cl. H04b 11/00
U.S. Cl. 340—15 9 Claims

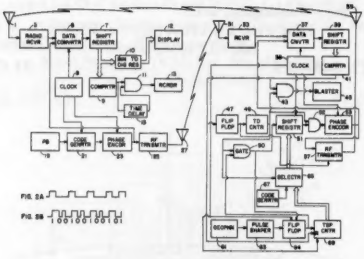


1. A device for repelling insects comprising electrical circuit means having input conductor means and output conductor means, power supply means connected to said input conductor means for supplying electrical power to said circuit means, said circuit means including unijunction transistor means electrically connected to said input conductor means and to said output conductor means, said circuit means being adapted to generate a continuous oscillating electrical signal having substantially a saw tooth wave form of continuously varying frequency at said output conductor means and transducer means connected to said output conductor means adapted to convert said electrical signal into a continuous sonic signal.

3,891,963
CODED RADIO SHOOTING UNIT

Curtis B. Herbert, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Oct. 23, 1973, Ser. No. 408,695
Int. Cl. G01v 1/14
U.S. Cl. 340—15.5 TS 11 Claims



1. Apparatus for controlling the activation of a seismic energy generator through a communications link between a control location and a generator location, comprising:

first means for transmitting a first coded signal from the control location to the generator through the communications link;

second means responsive to the first coded signal for transmitting a second coded signal through the communications link from the generator location to the control location;

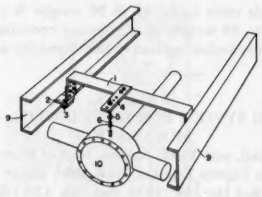
third means for activating the seismic energy generator response to the second coded signal, for measuring the time interval from activation of the seismic energy generator to the arrival of resulting seismic energy from the level of the seismic generator in the earth to the earth's surface and for sending a signal indicative of said time interval through the communications link to said control location; and

fourth means for generating a time zero signal at the control location responsive to the second coded signal.

3,891,964
TRUCK OR TRAILER AXLE OVERLOAD INDICATOR

Leo Franklin Geiger, 6803 Cherbourg Ave. North, Jacksonville, Fla. 32205

Filed July 15, 1974, Ser. No. 488,310
Int. Cl. G08b 21/00
U.S. Cl. 340—52 R 7 Claims

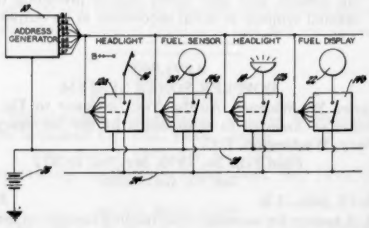


1. An improvement in axle overload indicators for motor trucks and trailers, said improvement consisting of an adjustable height horizontal beam with ends bent at substantially right angles, attached by nuts and bolts at each end through one of a plurality of pairs of holes in each member, to a pair of frame brackets, each of said frame brackets attached by nuts and bolts to a truck or trailer frame clamp plate, an indicator support bar rigidly attached to and extending frontwardly or rearwardly from the center of said horizontal beam, an indicator holder and adjustment bolt passing through and affixed to one of a plurality of holes in said indicator support bar, a flexible pendent indicator attached to and suspended from said indicator holder and adjustment bolt, the lower end of said pendent indicator being positioned directly over and in close proximity to the center of the truck or trailer axle or differential housing.

3,891,965
TIME DIVISION MULTIPLEX SYSTEM FOR A MOTOR VEHICLE

Thaddeus Schroeder, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1974, Ser. No. 506,224
Int. Cl. G08c 15/12
U.S. Cl. 340—52 F 4 Claims



1. In a motor vehicle having a source of direct current, a plurality of information input means and associated load means, a time division multiplex system for controlling the application of current to said load means comprising:

a sender-receiver set for each input means and associated load means;

address generator means for successively generating a plurality of multibit binary words;

conductor cable means including a power conductor for supplying current from said source to said address generator means and each of said sender-receiver sets, said cable means including an information conductor interconnecting each sender-receiver set, said cable means further including a plurality of address conductors interconnecting said address generator means with said sender-receiver sets, the number of address conductors corresponding to the number of bits in each of said plurality of multibit binary words;

each of said sender-receiver sets including address decoder means responsive to different binary words whereby information may be communicated between respective sender-receiver sets during the time the respective sender-receiver sets are being addressed;

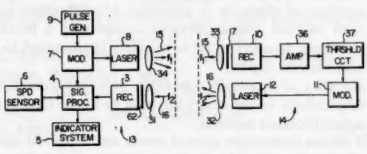
the receiver in each sender-receiver set controlling the application of current to the associated load means in response to the information received from the associated sender.

3,891,966

AUTOMOBILE COLLISON AVOIDANCE LASER SYSTEM

Zoltan G. Sztankay, 4450 S. Park Ave., No. 802, Chevy Chase, Md. 20015

Filed Aug. 8, 1974, Ser. No. 495,746
Int. Cl. B60t 7/12
U.S. Cl. 340—53 **5 Claims**



1. An automobile collision avoidance system comprising:

a. means located on the rear end of an automobile for receiving radiant energy at the frequency f_1;

b. means located on the rear end of an automobile for transmitting radiant energy at the frequency f_2;

c. means located on the front end of an automobile for transmitting radiant energy of a frequency f_1;

d. means located on the front end of an automobile for receiving radiant energy at the frequency f_2;

e. means responsive to the receipt of radiant energy at the frequency f_2 for determining the proper distance between a leading automobile and a trailing automobile; and

f. means responsive to said last-named means for providing an indication to the driver that the distance is less than a predetermined minimum.

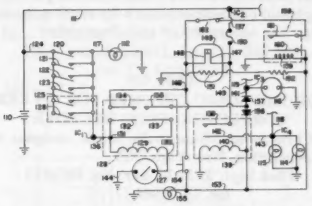
3,891,967

ANTITHEFT ALARM SYSTEM FOR AUTOMOBILES

Clifton R. Betts, 190 Jennifer Dr., San Pablo, Calif.

Continuation of Ser. No. 135,545, April 20, 1971. This application Oct. 15, 1973, Ser. No. 406,147
Int. Cl. B60g 1/04; B60r 25/10
U.S. Cl. 340—63 **10 Claims**

1. An alarm system for automotive vehicles and the like having an electrical system, also having at least one electrically operated device usable when energized to attract attention to such vehicle to protect the same against unauthorized entry into a compartment thereof, futher having a closure member for an access opening into such compartment, and still further having a compartment switch arranged with the closure member so as to be actuated by opening thereof, comprising: a circuit having a pluality of conductors connectable with such electrical system, device, and compartment switch; a master switch connected in said circuit and movable between open and closed positions for selectively conditioning said alarm system for operation; an alarm-actuating mechanism connected in said circuit so as to maintain the same normally in an inoperative condition and such device de-energized and to effect operation of said circuit and energization of such device whenever said master switch has conditioned said alarm system for operation and such compartment switch is actuated; said alarm-actuating mechanism and said circuit being provided with operation-maintenance means effective to maintain said circuit in an operative condition and such device energized following deactivation of such compartment switch; whereby such device and compartment switch are usuable in an ordinary manner but when said master switch is closed, opening such closure member will actuate the compartment switch to energize said alarm-actuating mechanism and such device and to maintain the energized state of the



latter even after deactuation of the compartment switch; condition-sampling means arranged in said circuit in operative connection with said alarm-actuating mechanism and operation-maintenance means thereof to test the condition of said circuit as determined by the condition of such compartment switch so as to return said circuit to an inoperative condition and de-energize such device after a predetermined time interval if such compartment switch is deactuated and set said alarm system for a subsequent cycle of operation or to permit said circuit to remain in the operative condition thereof with such device energized if such compartment switch remains actuated; and light switch means connectable with the exterior lights of such vehicle so as to energize the same and connected in circuit with said condition-sampling means, said light switch means being manually operable so as to energize such vehicle lights when desired and being returned to an inoperative state automatically by said condition-sampling means following expiration of a predetermined time interval.

3,891,968

COHERENT OPTICAL PROCESSOR APPARATUS WITH IMPROVED FOURIER TRANSFORM PLANE SPATIAL FILTER

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 4, 1974, Ser. No. 457,750
Int. Cl. G06k 9/13
U.S. Cl. 340—146.3 E **14 Claims**

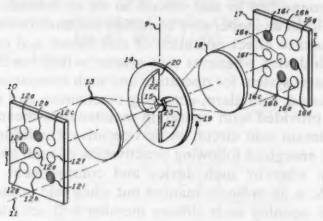
1. An optical processor fingerprint inspection apparatus comprising:

optical means for generating a diffraction pattern of the fingerprint to be identified in the Fourier transform plane of said inspection apparatus,

opaque mask means having at least one internal asymmetric transparent portion disposed fully within said mask means in said Fourier transform plane,

said internal asymmetric transparent portion having a radially disposed internal boundary edge cooperating with a curvate internal boundary edge for the cyclic control of the passage of light therethrough,

means for cyclically rotating said internal asymmetric transparent portion about the major axis of said optical means through said diffraction pattern,



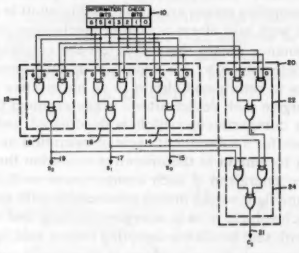
means responsive to radiant energy transmitted cyclically through said transparent portion between said radial and curvate internal boundary edges during passage thereof through said diffraction pattern for sensing the amplitude of ridge line separation of said fingerprint.

3,891,969

SYNDROME LOGIC CHECKER FOR AN ERROR CORRECTING CODE DECODER

Bruce A. Christensen, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 503,011
Int. Cl. G06f *11/10*
U.S. Cl. 340—146.1 AL **2 Claims**



1. In combination with a syndrome generator network that generates syndrome bits from a vinary word that includes information bits and check bits, a syndrome checker for detecting errors in the generation of said syndrome bits from said binary word, said syndrome checker comprising:

a parity predict network for generating a parity predict bit;

a parity check network for generating a syndrome check bit;

first means for coupling the bits of said binary word as inputs to said syndrome generator network and to said parity predict network in accordance with the following conditions:

1. each bit of the binary word appears in the syndrome generator network logic equations and the parity predict network logic equations an even number of times;

2. the output of each gate within the syndrome generator network and the parity predict network has an odd fan-out;

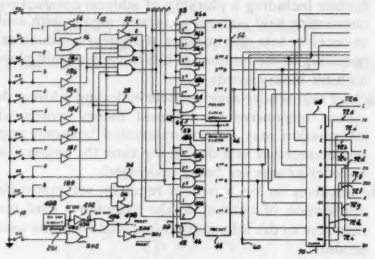
second means coupling said syndrome bits and said parity predict bit as inputs to said parity check network for generating as an output therefrom alternative signals for indicating that said syndrome bits are either correct or not correct.

3,891,970

TEN BUTTON SELECTION SYSTEM FOR AUTOMATIC PHONOGRAPH

William C. Brotz, Wyoming, Mich., assignor to Rowe International, Inc., Whippany, N.Y.

Filed Apr. 26, 1974, Ser. No. 464,575
Int. Cl. G11b *19/08*
U.S. Cl. 340—162 **36 Claims**



1. In an automatic phonograph adapted to play a multiplicity of selections identified by respective multi-digit numbers and having credit registering means which produces a credit signal indicating the existence of a credit equalling at least the price of a play, apparatus for visibly displaying the number of a selection including,

a number of digital display devices corresponding to the number of digits in a selection identification number, each of said display devices comprising a plurality of segments adapted to be selectively illuminated to represent various digits,

a plurality of manually operable switches corresponding respectively to the digits adapted to make up a selection indentification number,

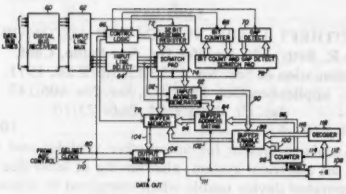
and means responsive to said credit signal and to operation of a number of said switches corresponding to the number of digits in an identification number for selectively illuminating the segments of said devices to cause said devices respectively to visibly display the digits making up a selected number.

3,891,971

SERIAL DATA MULTIPLEXING APPARATUS

Robert J. Hirvela, Cedar Rapids, and Robert A. Bolin, Marion, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 197,905, Nov. 11, 1971, abandoned. This application July 27, 1973, Ser. No. 383,237
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **3 Claims**



1. Apparatus for sampling digital data bits on a plurality of lines wherein the data bits are supplied at at least two different rates comprising, in combination:

a plurality of digital data source means some of which supply data at different rates; means for supplying a clock signal in conjunction with each data bit;

multiplexing means connected to each of said aforenamed means for receiving data and clock signals therefrom, said multiplexing means completing a cycle of sampling all of said data sources in a predetermined order in no greater time than the bit period of the highest rate data source means;

resettable data indication means for providing an indication of receipt of a clock signal in conjunction with a data bit;

scratch pad memory means for supplying and receiving data words in different locations in accordance with said predetermined order;

word assembly means, connected to said multiplexing means, said data indication means and said scratch pad means, for retrieving data words as assembled to date from said scratch pad memory means in said predetermined order;

means, forming a part of said word assembly means, for updating the retrieved word with a further data bit when same is received concurrently with an indication of receipt of a clock signal by the apparatus;

means, forming a part of said word assembly means, for resetting said data indication means to a clock signal not received condition and for returning the updated word to the location in saic scratch pad memory from which it was retrieved; and

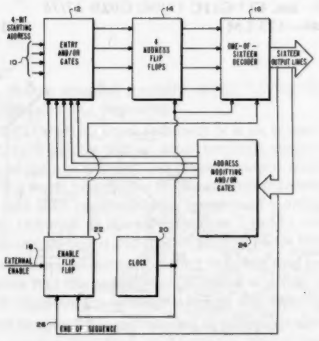
output means connected for receiving said data word after it is completely assembled in said word assembly means.

3,891,972

SYNCHRONOUS SEQUENTIAL CONTROLLER FOR LOGIC OUTPUTS

Gary L. Egan, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 9, 1972, Ser. No. 263,741
Int. Cl. G06f 9/20
U.S. Cl. 340—172.5 **2 Claims**



1. A synchronous sequential controller for issuing a predetermined sequence of instructions, said controller comprising:

gating means for sequentially gating starting and other addresses, each of which is associated with a separate instruction;

addressing means connected to said gating means for sequentially storing each of said addresses gated by said gating means;

decoding means connected to said addressing means for decoding the one of said addresses currently stored in said addressing means and for issuing the instruction associated with that address on a corresponding one of a plurality of separate output lines of said decoding means;

address modification means connected to the output lines of said decoding means and to said gating means for directly translating each instruction issued on any of the output lines of said decoding means into the one of said addresses associated with the next instruction in said predetermined sequence to be issued and for transmitting that address to said gating means;

clock means connected to said addressing means and to said decoding means for determining the point in time at which each of said instructions is to be issued; and

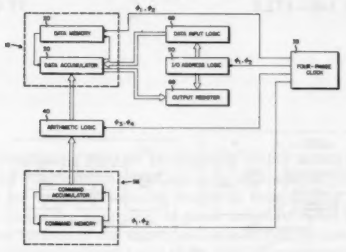
enabling means connected to said gating means and to said decoding means and responsive to said clock means for simultaneously enabling said decoding means and disabling said gating means.

3,891,973

MULTI-FUNCTION DIGITAL COUNTER/TIMER

Jerome Eugene Maxwell, Colorado Springs, Colo., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 16, 1973, Ser. No. 389,047
Int. Cl. G06f 7/38
U.S. Cl. 340—172.5 **15 Claims**



1. A multi-function numerical processor comprising:

a. electronic storage means to store a plurality of independent numerical words, each of said words being logically represented within said storage means as an ordered series of digits, each of said digits being in a selected arithmetic modulus and logically represented as an ordered series of binary bits, the totality of said words being logically represented within said storage means as an ordered cyclic series of binary bits, said storage means comprising an accumulator adapted to store one of said digits and a memory adapted to store all portions of said word series not stored in said accumulator;

b. shifting means to serially cause each of the binary bits comprising each of the digits stored within said storage means to exit said memory and enter said accumulator;

c. logic means to act on any specific digit instantaneously stored within said accumulator to perform thereon an arithmetic operation in the arithmetic modulus of said specific digit, said operation comprising changing the modular magnitude of said specific digit unitarily in a selected algebraic sign if and only if the elapsed time since the last change in said digit exceeds a selected period, said electronic logic means comprising:

1. first electronic means to generate an electrical output signal indicative of the condition wherein an entire digit is instantaneously stored within said accumulator;

2. second electronic means to generate an electrical output signal representative of the identity of the specific digit;

3. third electronic means, responsive to the output from

said second electronic means, to generate and electrical output signal representative of said algebraic sign;

4. chronometer means to generate an output signal indicating elapsed time; and

5. fourth electronic means, responsive to the output signals from said first electronic means, said third electronic means and said chronometer means, to perform said operation;

d. means to cause the binary bits comprising each digit stored within said accumulator to serially return, subsequent to the activity of said electronic logic means, to said memory into the assigned logical position of that particular digit within said word series; and

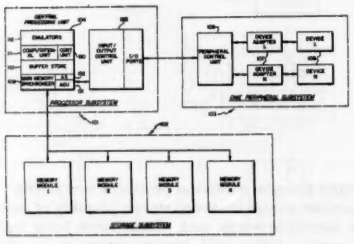
e. output means operable on said storage means to extract the instantaneous values of all digits constituting any selected one of said numerical words.

3,891,974

DATA PROCESSING SYSTEM HAVING EMULATION CAPABILITY FOR PROVIDING WAIT STATE SIMULATION FUNCTION

Brent W. Coulter, Bellingham, Mass., and Laurence F. Migdalek, Bethesda, Md., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 17, 1973, Ser. No. 425,661
Int. Cl.[2] G06F *9/18*
U.S. Cl. 340—172.5 **17 Claims**



1. A data processing system comprising:

A. a central processing unit for executing instructions in a native mode;

B. an emulation unit, coupled with said central processing unit, for executing instructions in a non-native mode, in order to emulate the operation of another central processing unit;

C. first means for indicating whether said central processing unit emulated by means of said emulation unit is in a wait state wherein no further emulation unit processing may continue;

D. second means for indicating whether there is a pending interrupt;

E. third means for indicating whether said pending interrupt is allowable;

F. means for enabling further processing in said native mode of said central processing unit while said emulated processing unit is in the wait state, and

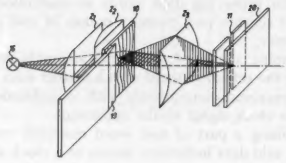
G. means responsive to said second and third means for indicating for again continuing execution in said non-native mode if said interrupt is pending and allowable.

3,891,975

METHOD AND ARRANGEMENT FOR RECORDING THE PHASE DISTRIBUTION OF AN OBJECT WAVE STORED IN A HOLOGRAM

Reinhold Deml, Munich; Ulrich Greis, Weyarn; Friedrich Bestenreiner, Grunwald, and Josef Helmberger, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 14, 1973, Ser. No. 370,098
Claims priority, application Germany, June 16, 1972, 2229381
Int. Cl. G02b *27/38*; **G11c** *13/04*
U.S. Cl. 340—173 LM **44 Claims**



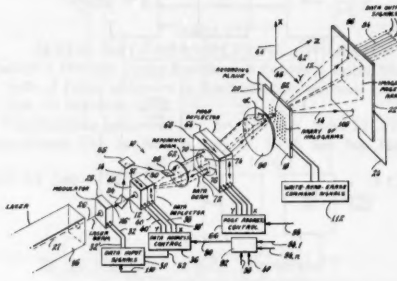
1. Method for recording the phase distribution of an object wave stored in a hologram, said hologram having a density distribution having a plurality of maxima, comprising, in combination, the steps of furnishing a pulse grating having a pulse for each of said maxima and summing the so-furnished pulses thereby creating a phase signal; and recording said phase signal.

3,891,976

HOLOGRAM MEMORY WITH SEQUENTIAL DATA STORAGE AND BEAM ANGULAR RELATIONSHIP

W. John Carlsen, Natick, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 14, 1974, Ser. No. 432,912
Int. Cl.[2] G11C *13/04*; **G02B** *27/38*
U.S. Cl. 340—173 LM **14 Claims**



1. A method for holographically processing digital data comprising the steps of

producing a beam of coherent energy,

modulating the beam with a bit of digital data,

dividing the modulated beam into a reference beam and a data beam,

deflecting the data beam by a first preselected angle selected from a first matrix array of angles maintaining the reference beam at a second preselected angle to establish a unique spatial relationship between the data beam and the reference beam,

deflecting both the data beam and the reference beam by a third preselected angle selected from a second matrix array of angles, and

focussing the data beam and the reference beam onto a recording medium so that the beams interfere and form a hologram of the bit of digital data in the recording medium, the third preselected angle determining the position of the hologram in the recording medium and the first and second preselected angles determining the angle of intersection of the data beam and the reference beam at the recording medium whereby the hologram of the bit of digital data has a unique address within the recording medium and may be stored in a sequential manner.

3,891,977

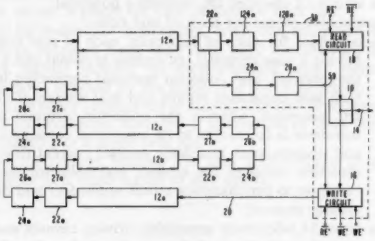
CHARGE COUPLED MEMORY DEVICE

Gilbert F. Amelio, Saratoga; Jack A. Livezey, San Jose, and Phillip J. Salsbury, Sunnyvale, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed July 15, 1974, Ser. No. 488,387

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **11 Claims**



1. A charge coupled memory device having input/output means, said device comprising:

a. N CCD shift registers (wherein N is an integer from 1 to N), each having register input terminal means for receiving serial bits of data, and register output means for supplying serial bits of data from said shift registers, and each of said shift registers being capable of storing M bits of data (wherein M is an integer from 1 to M), whereby said memory device is capable of storing M×N bits of data;

b. write terminal means, coupled between said input/output means and the register input means of a first one of said shift registers for writing data into said memory device;

c. read terminal means, coupled to said input/output means for reading data from said memory device; and,

d. N charge comparison circuits (wherein N is an integer from 1 to N), wherein each of N-1 of said circuits is uniquely coupled between the register output means of a corresponding one of said shift registers and the register input means of the next adjacent one of said shift registers, the Nth comparison circuit having an input terminal coupled to the output terminal means of the Nth shift register and having two output terminals for providing complementary output signals representative of the bits of data, wherein the first one of said two output terminals is coupled to said read terminal means of said memory device, and the second one of said two output terminals is coupled to both said write terminal means and said read terminal means so as to recirculate the serial bits of data through the shift registers, whereby the serial bits of data are recirculated through said N CCD shift registers at the same time the data is read from the memory device.

3,891,978

MAGNETIC DOMAIN PROPAGATING CIRCUIT

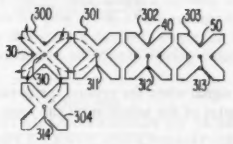
Haruki Kohara, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,340

Claims priority, application Japan, Dec. 29, 1972, 47-1855

Int. Cl. G11c *11/14, 19/00*

U.S. Cl. 340—174 TF **9 Claims**



1. A magnetic domain propagating circuit comprising: a sheet of magnetic material capable of retaining domains; means for applying a biasing magnetic field normal to said sheet; means for generating in-plane magnetic fields parallel with the surface of the sheet; and at least two ferromagnetic pieces disposed adjacent said sheet; said ferromagnetic pieces being responsive to said in-plane magnetic fields for creating a magnetic pole at a position thereon dependent upon the direction of said in-plane magnetic field, whereby a domain can be held at said position, said two ferromagnetic pieces being adjacent one another thereby forming a plurality of propagation paths for domains in both directions between said two ferromagnetic pieces, each of said two pieces having a geometic center and being symmetrical about an axis drawn through said center and further comprising at least four legs extending outwardly from said center, whereby a domain is held at said center in the absence of an in-plane magnetic field above a minimum value, and whereby a domain at said center of either of said two ferromagnetic pieces may be shifted to the center of the other of said ferromagnetic pieces by the generation of in-plane magnetic field pulses.

3,891,979

ROAD CONDITION MONITORING DEVICES

Otto Paul Braun, Freiberg, and Horst Oehler, Waiblingen, both of Germany, assignors to Otto P. Braun, Germany

Filed Oct. 23, 1973, Ser. No. 408,377

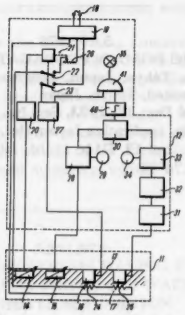
Claims priority, application Germany, Nov. 7, 1972, 2254351

Int. Cl. G08b *21/00*

U.S. Cl. 340—234 **18 Claims**

1. A device for detecting the danger of ice or snow on roads, comprising an electrical ground temperature sensor, an electrical salt content sensor, said sensors being adapted to be applied to the road surface, means connected to said sensors

for comparing the ground temperature with the freezing point of the particular salt soluton present, and means for producing



a warning signal when the ground temperature approaches the freezing point of the solution on the road surface.

3,891,980

SECURITY SYSTEMS

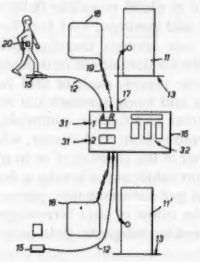
John Lewis, London, and William Dudley Gilmour, Glastonbury, both of England, assignors to Lewis Security Systems, Ltd., London, England

Filed Nov. 7, 1972, Ser. No. 304,560

Claims priority, application United Kingdom, Nov. 8, 1971, 51724/71; May 16, 1972, 22898/72

Int. Cl. G08b *13/18*

U.S. Cl. 340—258 D **22 Claims**



1. A security system including at least one portable token embodying a generator and transmitter of oscillations at a predetermined frequency, a pickup at a certain location and means in the pickup for responding to the oscillations transmitted from the token when the token is carried in any atatitude by a user who comes to the location, a sensor responsive to arrival of a person at the location, and a control unit rendered operative by response of the sensor and having means for providing a local reference signal, means responsive to the pick-up response and the local reference signal for forming an output signal, and means receiving the output signal for detecting whether the pickup is responding to oscillations at the predetermined frequency, and to deliver a control signal to dependence upon such detection.

3,891,981

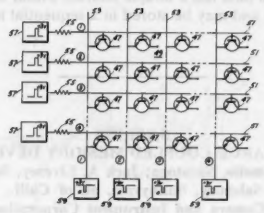
DRIVE CIRCUIT FOR A LIQUID CRYSTAL DISPLAY

Vincenzo N. Torresi, Tenafly, N.J., assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Feb. 20, 1973, Ser. No. 334,177

Int. Cl. G09f *9/32;* **G02f** *1/18*

U.S. Cl. 340—324 M **16 Claims**



1. In a display including a plurality of display cells, each of the type actuatable by a potential applied across display material between a pair of electrodes and wherein said cells are arranged in M groups of N cells, a driving circuit for multiplexing the cells comprising:

a source of chopped DC actuating potential;

capacitive means for each of said cells;

a transistor for each of said cells, each of said transistors having a base terminal, an emitter terminal and a collector terminal, said collector terminal connected in series with said capacitive means and said source of chopped DC potential, wherein the collector terminal of each transistor is connected to its associated capacitive means and wherein each transistor enables current flow in one direction between the emitter and collector thereof in response to simultaneous pulses applied to said base and emitter thereof;

a set of M selectively actuatable driving circuits each connected to the base of the transistor of each cell of the corresponding group for applying base-emitter junction saturating pulses to the transistors of the cell of at least one of the M groups; and

a set of N sequentially actuatable driving circuits each connected to the emitter of one transistor in each of the M groups for sequentially applying base-emitter junction enabling pulses to the successive sets of transistors connected thereto for enabling the selective actuation of said set of M driving circuits to saturate said base emitter junction of said successive groups of transistors and for preventing the saturation by said M driving circuits of the base-emitter junction of the transistors of the others of said groups.

3,891,982

COMPUTER DISPLAY TERMINAL

Thomas B. Cheek, Lexington; Daniel E. Thornhill, Brookline, and Ronald B. Stewart, Arlington, all of Mass., assignors to Adage, Inc., Boston, Mass.

Filed May 23, 1973, Ser. No. 362,952

Int. Cl. G08b *5/36*

U.S. Cl. 340—324 AD **10 Claims**

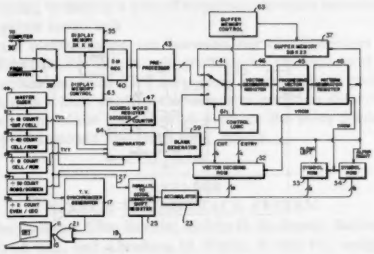
1. Apparatus for repetitively generating a video signal for driving a raster scan display from data encoded in data words representing respective vector segments, the raster scan being divisible into an angular array of rows and columns of cells, each vector segment, as encoded, lying within a single cell with more than one image component being permissible per cell, each word being encoded in a form defining starting

point, slope and length in one dimension; said apparatus comprising:

a serial, circulatory memory for holding, in cell order, data words defining an image to be displayed;

means for selectively advancing the contents of said memory to read out all data words pertaining to a given cell;

means for modifying each data word during the initial scan line traversing the vector segment to generate entry and exit values defining the picture element positions in that line affected by the vector segment, the exit value replacing the starting point values in the data word during subsequent circulations, and for progressively modifying



each data word during successive scans to generate, from the previous exit value and the slope, new entry and exit values defining the picture element positions affected by the vector segment on each respective scan line;

decoding means for generating, from the entry and exit values obtained from each data word successively read out, signals defining the corresponding image element positions affected by the respective vector segment;

an accumulator register for accumulating data representing the contributions made by a succession of data words pertaining to a given cell; and

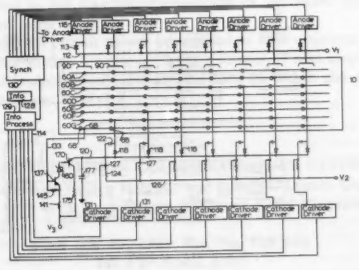
means for serially reading out data accumulated in said register as a video signal to said display.

3,891,983

MULTI-POSITION CHARACTER DISPLAY PANEL HAVING DISPLAY CATHODES AND AUXILIARY CATHODES AND CIRCUITS FOR OPERATING THE SAME

James Y. Lee, New Brunswick, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 20, 1974, Ser. No. 481,172
Int. Cl. G08b *5/36*
U.S. Cl. 340—336 **10 Claims**



1. A display panel and system for operating the same comprising

a gas-filled envelope including a base plate and a face plate having a viewing window,

a plurality of groups of display cathode electrodes supported on said base plate and adapted to be operated in different combinations to display different characters,

corresponding cathodes in all of the groups being interconnected by a single common conductor, there thus being a single common conductor for each corresponding cathode electrode in each of said groups,

an auxiliary cathode electrode associated with each said group of display cathodes,

an auxiliary common conductor connected to all of said auxiliary cathodes,

an anode electrode associated with each said group of cathodes,

means coupled to said anodes and said common conductors for sequentially energizing each of said anode electrodes and simultaneously applying information signals to selected ones of said common conductors and their associated display cathodes, and

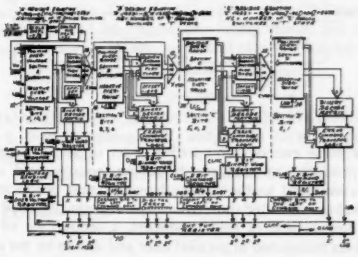
a circuit loop connected between said auxiliary common conductor and all of said single common conductors including means for generating a bias voltage in response to current flow through an auxiliary electrode and applying said bias voltage to all of said display cathodes.

3,891,984

ANALOG TO DIGITAL CONVERSION BY SUBRANGING WITH MULTIPLE LEVEL REDUNDANT ERROR CORRECTION

Robert D. Kerwin, Orange, and Darwin B. Sulzle, Placentia, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 7, 1973, Ser. No. 338,727
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 CC **2 Claims**



1. An analog to digital converter apparatus with digital error correction comprising in combination:

an analog to digital converter having four stages to generate an 11 bit word, said analog to digital converter receiving an input voltage signal, said first state generating a 3 bit word, said second and third stages each generating a 3 bit word, said fourth stage generating a 2 bit word, said analog to digital converter providing an output binary count, said second, third and fourth stages including a plurality of redundancy comparators, (said plurality of redundancy comparators respectively checking the output of the previous stages) said plurality of redundancy comparators respectively generating a correction command for the affected stage upon sensing an error therein.

a plurality of decode logic units respectively connected to said four stages of said analog to digital converter to receive the respective word bit, said plurality of decode logic units respectively decoding said output binary count, said plurality of decode logic units providing a binary word output, said plurality of decode logic units

respectively including error command logic units connected respectively to said plurality of redundancy comparators of said second, third and fourth stages of said analog to digital converter, said error command logic units respectively providing an error correction signal upon receipt of said correct command from one of said plurality of redundancy comparators,

an interim holding register connected to said plurality of decode logic units to store said binary word output,

a digital error correction unit connected to said interim holding register to receive said binary word output, said digital error correction unit receiving error correction signals from said plurality of decode logic units, said error correction signals being utilized by said digital error correction unit to correct said binary word output, and

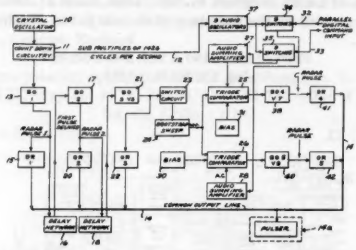
an output register connected to said digital error correction unit to receive said binary word output, said output register aligning said binary word output in time, said output register providing a final 11 bit output word.

3,891,985

DRONE CONTROL SYSTEM WITH PULSE POSITION ENCODING

Tarald H. Olgarden, Cold Spring Harbor; Erwin S. Teltscher, Forest Hills, and Robert D. Gross, New York, all of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 21, 1961, Ser. No. 90,886
Int. Cl. G08c *19/22, 19/28*
U.S. Cl. 340—353 **6 Claims**



1. A pulse encoder comprising a set of series connected pulse producers, a multiple frequency source, said source being connected to the input of one of said producers the latter being controlled thereby, delay networks disposed in the series connections of said producers, a second set of pulse producers connected in parallel lines and driven by the output of the first mentioned set of producers, means for pulse position modulating the pulses generated by said second set of pulse producers, said means being controlled by said source and another of said producers, a common output line, each of said pulse producers in the two sets of producers being individually connected to said common output line, and a pulser connected to said output line.

3,891,986

AUDIO-VISUAL WARNING SYSTEM

Gordon C. Lipe, Box 114, Teton Village, Wyo. 83025, and William S. Abbott, 20 Lakeview Cir., Skaneateles, N.Y. 13152

Continuation-in-part of Ser. No. 204,125, Dec. 12, 1971, Pat. No. 3,786,498. This application Jan. 14, 1974, Ser. No. 433,116
Int. Cl. G08b *7/00*
U.S. Cl. 340—371 **15 Claims**

1. A combined audible-visual warning system for use with a vehicle, or the like, comprising:

a. an electrical power source;

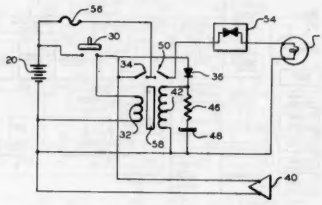
b. an electrically operated audible warning element;

c. an electrically operated visual warning element;

d. a single, manually operable switch selectively closable to effect connection of both said audible and visual warning elements to said power source; and

e. timing means effective to insure that electrical power is provided to said visual warning element for at least a predetermined minimum time after closure of said switch irrespective of whether said switch is retained in the closed position for such minimum time, said timing means comprising a relay having:

i. a first coil energized by closure of said switch;



ii. first contacts closed by energization of said first coil to connect said audible warning element to said power source;

iii. second contacts closed by energization of said first coil to connect said visual warning element to said power source;

iv. a second coil energized by closure of at least one of said switch and said first contacts; and

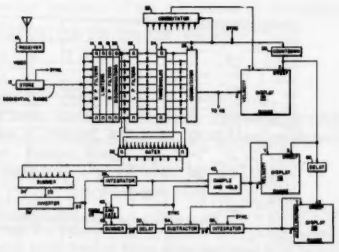
an RC timing network connected in parallel with said second coil to maintain the latter in an energized condition for a predetermined time after said first coil is deenergized by opening of said switch, the force exerted by said relay when said first coil is deenergized and said second coil is energized being effective to maintain only said second contacts closed.

3,891,987

ONE-OPERATION SIGNAL PROCESSOR

Garold K. Jensen, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 18, 1969, Ser. No. 862,632
Int. Cl.² G01s *7/06, 9/02*
U.S. Cl. 343—5 R **6 Claims**



6. In a data processing and display system for radar wherein the receiver video doppler signal is stored in range order and, upon readout, is further separated by frequency into a plural-

ity of channels, each of which includes a discriminator and a threshold device that produces an output only when energized by a discriminator output signal in excess of a certain strength, such as is caused by a target of constant velocity or by jamming, display apparatus comprising:

first cathode ray tube (CRT) means synchronized with said readout and connected to said plurality of channels to display a plot of constant velocity target or jamming information against range;

second CRT means synchronized with said readout and functioning to display a plot of non-constant velocity target information against range;

third CRT means synchronized with said readout and functioning to display a plot of target acceleration information against range and

circuit means connected between the discriminators and threshold devices in said plurality of channels and said second and third CRT means and functioning to produce signals which control the intensity and one directional position of the traces which produce the plots displayed by said second and third CRT means.

3,891,988

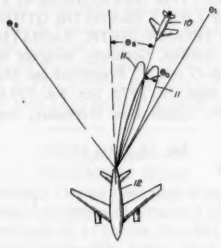
SEARCH-WHILE-TRACK SYSTEM

Charles C. Ryan, Glen Burnie; Melvin D. Siedband, Baltimore, both of Md., and Abraham M. Fuchs, Rydal, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 31,498, May 24, 1960, abandoned. This application Jan. 16, 1964, Ser. No. 338,271

Int. Cl.[2] G01S *9/22, 7/28*

U.S. Cl. 343—16 LS **3 Claims**



1. In a search-while-track radar system for determining the angular position of a target without stopping the antenna,

saturated amplifier means adapted to receive video return signal pulses from said target,

said saturated amplifying means having a storage means for storing the bias developed by said saturated amplifier means and allowing said bias to decay at a rate proportional to the change in amplitude of the video returns from pulse to pulse, and

comparator circuit means connected to said saturated amplifier means for comparing the output of said amplifier with pulses which identify the lobe in which the video signals are received.

3,891,989

RADAR CONFUSION COUNTERMEASURE SYSTEM

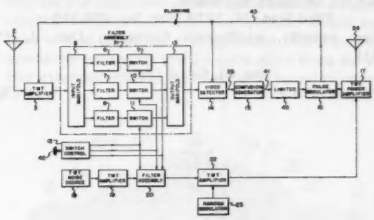
Kay H. Barney, Roslyn Heights, and John M. Lester, Garden City, both of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 27, 1959, Ser. No. 789,444

Int. Cl.[2] H04K *3/00*

U.S. Cl. 343—18 E **6 Claims**

1. Apparatus comprising wide band pulsed microwave signal receiving means, first filter means connected to said receiving means for directing the pulsed signal output therefrom into respective microwave frequency channels according to frequency content, first signal combining means, each said frequency channel including a switch for selectively connecting its respective channel to said first signal combining means, a detector connected to the output of said first signal combining means, a plurality of pulse delay means, each said delay means introducing a unique delay in the pulse respectively applied thereto, a plurality of gating circuits equaling in number the number of said plurality of pulse delay means, each of said gating circuits when actuated applying the output pulse from said detector to a respective one of said plurality of pulse delay means, means for substantially randomly actuating said gating circuits, second signal combining means for combining the outputs of said plurality of delay means, a source of local



signals commensurate in frequency extent with that of said wide band receiving means, second filter means connected to said local signal source for directing the outputs therefrom into respective local signal channels according to frequency content, third signal combining means, each said local signal channel including a switch for selective connection to said third signal combining means, means for selectively actuating the switches of said microwave and local signal channels in corresponding frequency pairs, gated amplifying means connected to the outputs of said second and third signal combining means, said gated amplifying means being actuated by the output of said second signal combining means for amplifying the output of said third signal combining means, and antenna means for radiating the output of said gated amplifying means.

3,891,990

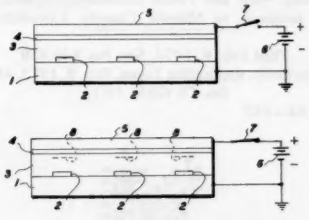
IMAGING PROCESS USING DONOR MATERIAL

John B. Wells, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 27, 1973, Ser. No. 374,215

Int. Cl. G01d *15/06*

U.S. Cl. 346—74 E **11 Claims**



1. A method for forming charge patterns which comprises the steps of:

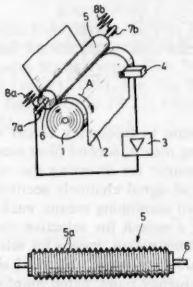
a. providing in imagewise configuration a layer of an injecting material on a conductive substrate to form an injecting master, said injecting material being capable of generating and injecting charge carriers in response to electrical field alone;

b. providing a layer of an insulating liquid on said injecting master;
c. contacting the free surface of said layer of insulating liquid with an insulating member; and,
d. applying an electrical potential difference across said injecting material and said insulating liquid layer of sufficient magnitude to cause said injecting material to form a charge pattern on said insulating member as a result of charge carrier injection from said injection material.

3,891,991
RECORDING APPARATUS WITH IMPROVED COUNTERELECTRODE

Kurt Hurst, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 24, 1973, Ser. No. 400,319
Claims priority, application Germany, Oct. 2, 1972, 2248318
Int. Cl. G01d *15/06*
U.S. Cl. 346—74 E **11 Claims**

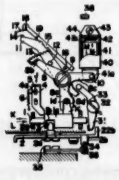


1. In an apparatus for recording intelligence on an electrosensitive web, a combination comprising transporting means arranged to advance a web lengthwise along a predetermined path and including an advancing member engaging one side of the web in said path; at least one writing electrode contacting the other side of the web in said path; and a counterelectrode adjacent to said other side of the web opposite said advancing member, said counterelectrode having a plurality of web-engaging projections forming part of an external thread on said counterelectrode.

3,891,992
SINGLE LENS REFLEX CAMERA

Hiroshi Ueda, Nara, and Yoshio Kuramoto, Toyonaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Feb. 8, 1974, Ser. No. 440,859
Claims priority, application Japan, Feb. 9, 1973, 48-16257
Int. Cl. G03b *19/12*
U.S. Cl. 354—152 **7 Claims**

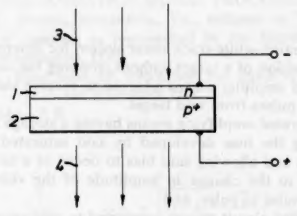


1. A single lens reflex camera comprising:
a reflecting mirror movable between a viewing position and a picture taking position and urged to assume said viewing position;
a reflecting mirror operating member for shifting said mirror, said operating member being movable between a first position and a second position in which said mirror assumes said viewing and picture taking positions respectively;
an interchangeable lens removably mounted on said camera and having a diaphragm;
a diaphragm operating member engaging said diaphragm and movable between a first position in which said diaphragm is brought to its open position, against a tendency thereof to close, and a second position in which said diaphragm is allowed to close to a minimum aperture;
means urging said diaphragm from its open position to its closing position;
means urging said diaphragm operating member to said first position;
an actuating member movable between a cocked position and a rest position, to urge said reflecting mirror operating member and said diaphragm operating member from said first position to said second position respectively;
means for locking said actuating member in the cocked position and unlocking the same in association with a shutter release operation; and
an air damper for decelerating the movement of said actuating member, said air damper including a cylinder supported by the camera body and a piston slidable within said cylinder and interconnected with said actuating member.

3,891,993
SEMICONDUCTOR ARRANGEMENT FOR THE DETECTION OF LIGHT BEAMS OR OTHER SUITABLE ELECTRO-MAGNETIC RADIATION

Heinz Beneking, Aachen, Germany, assignor to Licentia-Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 20, 1973, Ser. No. 399,042
Claims priority, application Germany, Sept. 29, 1972, 2247966
Int. Cl. H01l *15/00*
U.S. Cl. 357—19 **18 Claims**



1. A semiconductor arrangement for the detection of light beams comprising in combination:
a semiconductor body having a first region of a first conductivity type, constituting a light sensitive photo-resistance, for producing charge carriers as a result of light irradiation and a second region of semiconductor material of a larger band spacing than said first region and of the opposite conductivity type abutting said first region and forming a pn hetero-junction luminescent diode therewith, said second region recombining said charge carriers to emit light radiation; and means for applying a voltage across said first and second region to polarize said pn hetero-junction in the forward direction.

3,891,994
COLOUR TELEVISION

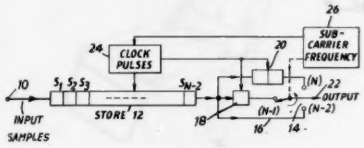
Geoffrey John Phillips, London, and John Philip Chambers, Crawley, both of England, assignors to The Marconi Company Limited and Standard Telephones & Cables Limited, both of London, England, part interest to each

Filed Sept. 12, 1973, Ser. No. 396,412

Claims priority, application United Kingdom, Oct. 9, 1972, 46500/72

Int. Cl. H04n *9/38*

U.S. Cl. 358—11 **10 Claims**



7. A method of sampling a PAL colour television signal, said method comprising the steps of:

sampling a PAL colour television signal at a sampling rate which bears a ratio of small integers to the frequency of the colour subcarrier; and

simultaneously maintaining sampling instants at points symmetrically disposed in time about the maxima and minima of the U-component of the signal sampled.

9. A method of converting a PAL colour television signal to an N.T.S.C. signal, comprising sampling said PAL signal at a sampling rate which bears a ratio of small integers to the colour subcarrier frequency, the sampling instants being symmetrically disposed about the phase of the B-Y component of the PAL signal, and re-ordering the samples with a subcarrier phase sequence such as to provide a signal of N.T.S.C. form.

3,891,995
MAGNETIC HEAD

Masanobu Hanazono; Osamu Asai, and Kanji Kawakami, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 4, 1973, Ser. No. 394,257

Claims priority, application Japan, Sept. 14, 1972, 47-91708

Int. Cl. G11b *5/20*

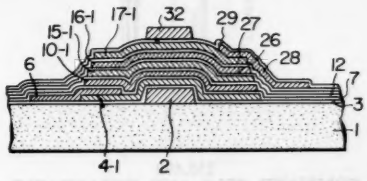
U.S. Cl. 360—123 **10 Claims**

1. A magnetic head comprising:

a first magnetic film and a second magnetic film disposed on a substrate, said first and second magnetic films forming a magnetic gap therebetween at one of the respective ends thereof, said gap lying substantially in a plane including an end surface of said substrate, said first and second magnetic films being magnetically coupled with each other at the other respective ends thereof;

a plurality of electrically conductive films laid one upon another substantially on a given area on said substrate when seen in plan view, the lamination of said plurality of electrically conductive films traversing an area between said first and second magnetic films, said plurality of electrically conductive films being electrically insulated from one another and from said first and second magnetic films;

a plurality of coil forming electrically conductive members including first, second, third and fourth portions, said first and second portions respectively extending from respective ends of respective ones of said plurality of electrically conductive films in a direction opposite to said end surface of said substrate, said third and fourth portions respectively extending toward each other from the respective extended ends of said first and second portions, said



first and second portions being respectively laid one upon another substantially on respective given areas on said substrate, the respective extended ends of said third and fourth portions being electrically connected with each other outside of said area between said first and second magnetic films so that said plurality of electric conductive films are connected in series through said plurality of coil forming electrically conductive members to thereby form a continuous coil, the respective connections between said third and fourth portions being disposed, when seen in plan view and in the longitudinal direction of said lamination of said plurality of electrically conductive films, within a length which is obtained by moving in parallel the length of said lamination of said plurality of electrically conductive films and outside of said area between said first and second magnetic films; and

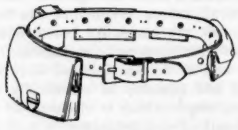
a pair of lead-out electrically conductive members respectively connected to the two free ends of said continuous coil formed by said plurality of electrically conductive films and said plurality of coil forming electrically conductive members.

DESIGNS

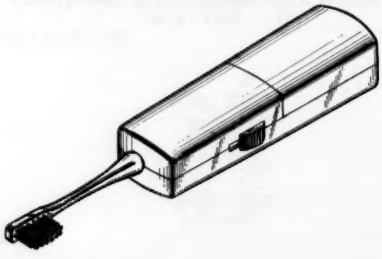
JUNE 24, 1975

235,489
REFLECTIVE SAFETY VEST
Louis Spitz, Los Angeles, Calif.
(463 S. Almont Drive, Beverly Hills, Calif. 90212)
Filed Apr. 29, 1974, Ser. No. 465,261
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

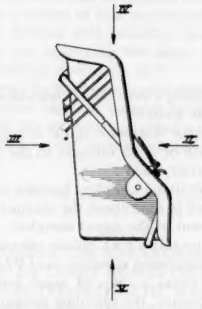
235,490
COMBINED BELT AND DETACHABLE COMPARTMENTS
James D. Lewis, 3716 Indiana St.,
San Diego, Calif. 92103
Filed Dec. 26, 1973, Ser. No. 428,119
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381



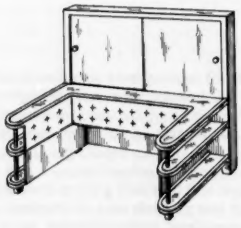
235,491
ELECTRIC TOOTHBRUSH
Norman Spiegel, New York, N.Y., assignor to Nasta Industries, Inc., New York, N.Y.
Filed Oct. 17, 1973, Ser. No. 407,060
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—15



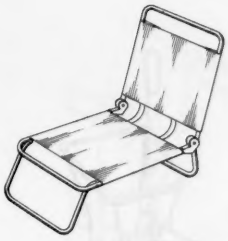
235,492
CHILD SAFETY SEAT FOR USE IN VEHICLES
Daniel A. Armstrong, Utica, and Thomas B. Bartholomew, Orchard Lake, Mich., assignors to American Safety Equipment Corporation, Encino, Calif.
Filed Oct. 1, 1973, Ser. No. 402,333
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—7



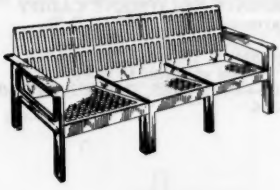
235,493
HEADBOARD
Linda Louise Bingley, East Star Rte., Box 10, Nowata, Okla. 74048
Filed Feb. 12, 1973, Ser. No. 331,527
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80



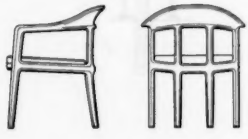
235,494
ADJUSTABLE BEACH CHAIR
Siegfried Von Juergensonn, Saddle River, N.J., assignor to Kettler of America, Inc., Mahwah, N.J.
Filed June 28, 1973, Ser. No. 374,300
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38



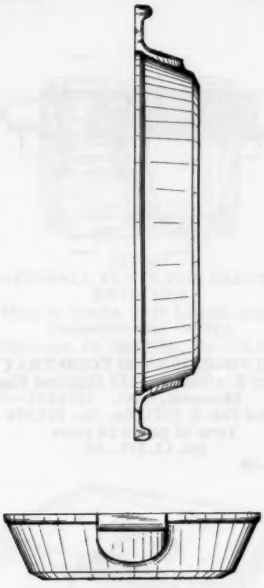
235,495
SECTIONAL SOFA
Harry Laylon, Syracuse, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 2, 1973, Ser. No. 337,709
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



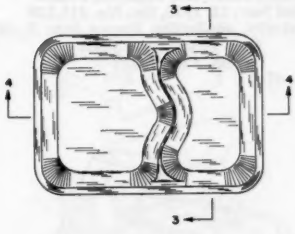
235,496
CHAIR
Akihiko Noda, Tokyo, and Satoshi Tada, Uenoharamachi, Japan, assignors to France Bed Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1973, Ser. No. 336,486
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—70



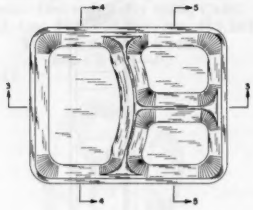
235,497
BAKING DISH
Gunnar Cyren, Gavle, Sweden, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,929
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—21



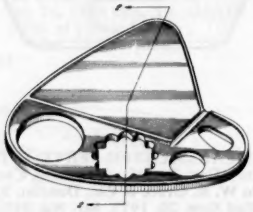
235,498
COMPARTMENTED SERVING TRAY
William Henry Day, Brantford, Ontario, Canada, assignor to W. R. Grace & Co., Duncan, S.C.
Filed Sept. 20, 1973, Ser. No. 399,202
Term of patent 14 years
Int Cl. D7—*99*
U.S. Cl. D7—38



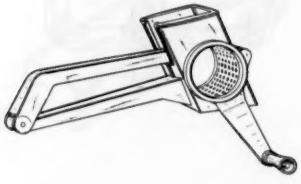
235,499
COMPARTMENTED SERVING TRAY
William Henry Day, Brantford, Ontario, Canada, assignor to W. R. Grace & Co., Duncan, S.C.
Filed Sept. 20, 1973, Ser. No. 399,219
Term of patent 14 years
Int Cl. D7—*99*
U.S. Cl. D7—38



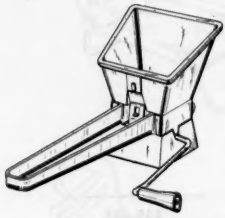
235,500
THUMB-ORIENTED FOOD TRAY
Merton J. Alexander, 173 Highland Place, Monrovia, Calif. 91016
Filed Oct. 3, 1973, Ser. No. 402,976
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



235,501
DOMESTIC FOOD GRATER
Jean Mantelet, Paris, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France
Filed Nov. 12, 1973, Ser. No. 415,229
Claims priority, application France June 5, 1973
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47

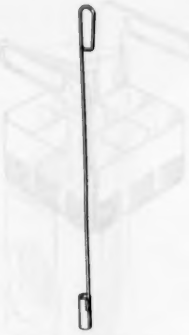


235,502
DOMESTIC FOOD CHOPPER
Jean Mantelet, Paris, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France
Filed Nov. 12, 1973, Ser. No. 415,230
Claims priority, application France June 5, 1973
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—155



235,503
FIREPLACE EQUIPMENT CADDY
Raymond H. Fry, 1017 W. D St., Ontario, Calif. 91762
Filed May 7, 1973, Ser. No. 358,044
Term of patent 14 years
Int. Cl. D6—*04;* D7—*08;* D11—*02;* D21—*01*
U.S. Cl. D7—206

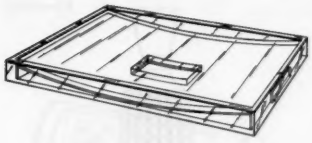
235,504
EARTH PLUG REMOVER
Marshall J. Kramer, Creve Coeur, Mo. (11301 Trieste, St. Louis, Mo. 63141)
Filed Jan. 21, 1974, Ser. No. 435,122
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—7



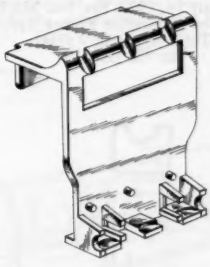
235,505
BAR FOR TURNING OVER A SHUT-DOWN MACHINE
Albert C. Phelps, 3219 W. Lisbon Ave., Milwaukee, Wis. 53208
Filed Apr. 23, 1973, Ser. No. 353,521
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88

235,506
CABLE CORING TOOL
James J. Matthews, East Haddam, Conn., assignor to Utility Tool Corp., East Haddam, Conn.
Filed Apr. 4, 1973, Ser. No. 347,862
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

235,507
SNAP-ON WALL PLATE FOR ELECTRICAL SWITCHES
Dean R. Straka, 2319 Lincoln Ave., Evansville, Ind. 47714
Filed Apr. 16, 1973, Ser. No. 351,171
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—181



235,508
VALVE BRACKET
Tetsumi Yamasaki, 12–8 Sakae-Honmachi, Ikeda, Osaka, Japan
Filed May 2, 1974, Ser. No. 466,515
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233

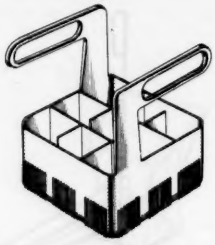


235,509
BOTTLE
Edward van Amerongen, Wilmette, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.
Filed Nov. 17, 1972, Ser. No. 307,343
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—83

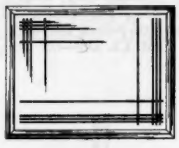
235,510
BOTTLE
Humberto Pilato Blat, Actor Mora 14, Valencia, Spain
Filed Nov. 6, 1973, Ser. No. 413,205
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—130

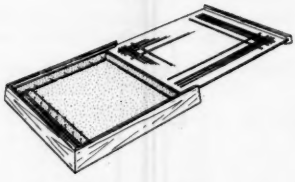
235,511
BOTTLE
Jean Boy, Luzarches, France, assignor to Compagnie Francaise des Parfums D'Orsay, Puteaux, Hauts-de-Seine, France
Filed July 26, 1973, Ser. No. 382,792
Claims priority, application France Apr. 18, 1973
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

235,512
BOTTLE CARRYING CASE
Rodney D. Marchetti, 1114 W. Lancaster, Bluffton, Ind. 46714
Filed Jan. 10, 1972, Ser. No. 216,903
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—179

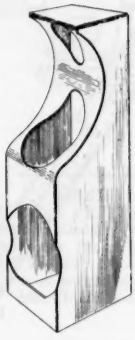


235,513
JEWELRY BOX
Glen A. Greer, 7416 NW. 7th 73127, and Robert W. Boutz, 5530 Woodbrier 73122, both of Oklahoma City, Okla.
Filed Apr. 11, 1973, Ser. No. 350,076
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—223

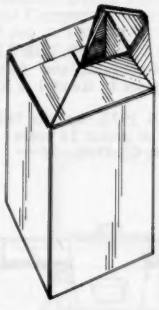




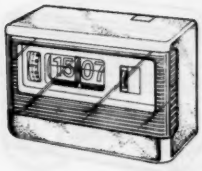
235,514
CARTON
Robert A. Hackenberg, East Lyme, Conn. (% Robertson Paper Box Co., Inc., Montville, Conn. 06353)
Filed Aug. 28, 1972, Ser. No. 284,368
Term of patent 7 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



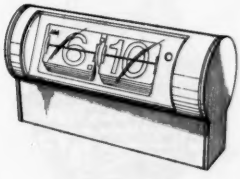
235,515
DISPENSING CONTAINER OR SIMILAR ARTICLE
Harry B. Egleston, Livonia, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Mar. 10, 1972, Ser. No. 233,851
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—240



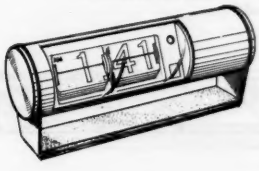
235,516
DIGITAL ALARM CLOCK
Hideaki Nagata, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed June 25, 1973, Ser. No. 373,309
Claims priority, application Japan Dec. 27, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



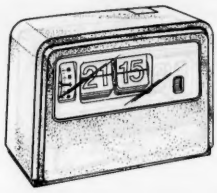
235,517
DIGITAL CLOCK
Riki Watanabe, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed June 25, 1973, Ser. No. 373,310
Claims priority, application Japan Dec. 27, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



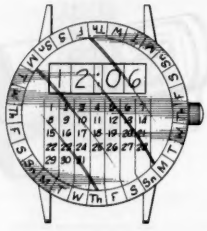
235,518
DIGITAL CLOCK
Riki Watanabe, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed June 25, 1973, Ser. No. 373,311
Claims priority, application Japan Dec. 27, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



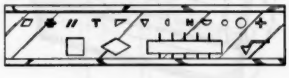
235,519
DIGITAL ALARM CLOCK
Hideaki Nagata, Tokyo-to, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan
Filed June 25, 1973, Ser. No. 373,312
Claims priority, application Japan Dec. 27, 1972
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



235,520
DIGITAL CALENDAR WATCH
Young D. Kwon, 531 Whitten Way, Placentia, Calif. 92670
Filed May 2, 1973, Ser. No. 356,582
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39



235,521
TEMPLATE
Jack Miles Donnelly, Chesterfield Village, near Lichfield, England, assignor to Girling Limited, Birmingham, England
Filed June 25, 1973, Ser. No. 372,936
Claims priority, application Great Britain Jan. 27, 1973
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D10—64

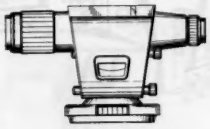


235,522
COMBINED MEASURING AND CALCULATING SCALE
Elmer Harold Cunningham, P.O. Box 552, Bowie, Tex. 76230
Filed Feb. 1, 1973, Ser. No. 329,203
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71

235,523
COMBINED CLOCK AND CABINET
Murray Miller, 24 Shorewood Drive, Port Washington, N.Y. 11050, and Andrew Kunkel, 49 Roosevelt Court, Westbury, N.Y. 11590
Filed Feb. 19, 1974, Ser. No. 443,727
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—2

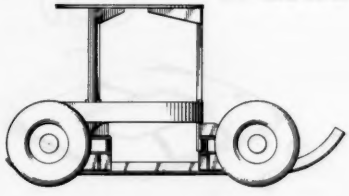
235,524
LEVEL TRANSIT OR THE LIKE
J. Peter E. Kool, Succasunna, and Allister L. Baker, Denville, N.J., assignors to Keuffel & Esser Company, Morristown, N.J.
Filed Aug. 16, 1973, Ser. No. 389,062
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66

235,525
AUTOMATIC LEVEL TRANSIT OR THE LIKE
J. Peter E. Kooi, Succasunna, and Allister L. Baker, Denville, N.J., assignors to Keuffel & Esser Company, Morristown, N.J.
Filed Aug. 22, 1973, Ser. No. 390,458
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66

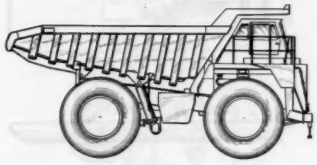


235,526
BICYCLE REFLECTOR
Nicholas A. Amoroso, Hillsdale, N.J., assignor to Bright Star Industries, Inc., Clifton, N.J.
Filed Mar. 27, 1974, Ser. No. 455,133
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

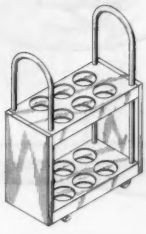
235,527
SLED FOR TRANSPORTING A SEISMIC ENERGY GENERATOR
Clifford D. Dransfield, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Jan. 3, 1974, Ser. No. 430,545
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—1



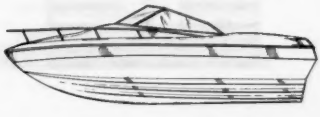
235,528
DUMP TRUCK
Jacob W. Ahola, Decatur, Bernard E. Erlacher, Washington, and Richard E. Guhl, Samuel L. Kershaw, and Alfred W. Sieving, Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 30, 1974, Ser. No. 437,988
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—15



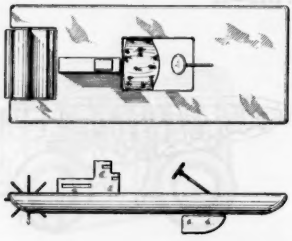
235,529
CART FOR OXYGEN CYLINDERS
John P. Salsgiver, 29 Ethan Allen Drive, Acton, Mass. 01720
Filed June 22, 1973, Ser. No. 372,831
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29



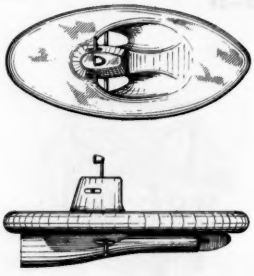
235,530
BOAT
David T. Livingston, Seattle, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.
Filed Aug. 24, 1973, Ser. No. 391,226
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



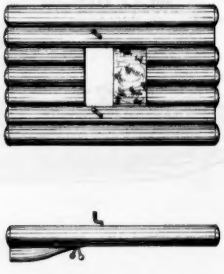
235,531
CHILD'S BOAT SHAPED LIKE A STERNWHEELER
Rodolphe J. Bernard, 16330 Sandalwood, Fountain Valley, Calif. 92708
Filed June 6, 1974, Ser. No. 477,005
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—68



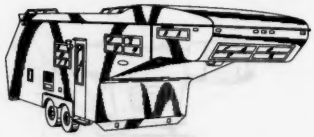
235,532
CHILD'S BOAT SHAPED LIKE A SUBMARINE
Rodolphe J. Bernard, 16330 Sandalwood, Fountain Valley, Calif. 92708
Filed June 6, 1974, Ser. No. 477,006
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—68



235,533
CHILD'S BOAT SHAPED LIKE A LOG RAFT
Rodolphe J. Bernard, 16330 Sandalwood, Fountain Valley, Calif. 92708
Filed June 6, 1974, Ser. No. 477,008
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—68



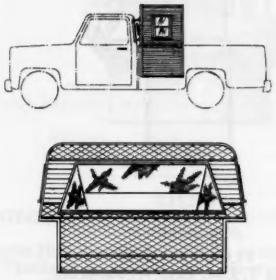
235,534
MOBILE HOME
John May, Rte. 2, Concordia, Mo. 64020
Filed Oct. 5, 1972, Ser. No. 295,221
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—103



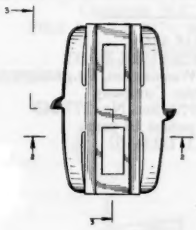
235,535
TIRE FOR A VEHICLE WHEEL
Brian Howard Holmes, Birmingham, and Clive Flint, Sutton Coldfield, England, assignors to Dunlop Limited
Filed June 29, 1973, Ser. No. 375,179
Claims priority, application Great Britain Jan. 19, 1973
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

235,536
DETACHABLE SUNROOF FOR A PASSENGER VEHICLE
Andrew W. Boston, Jr., 4618 Rodeo 90016, and Lance M. Porter, 1116 W. 96th St. 90044, both of Los Angeles, Calif.
Filed June 11, 1973, Ser. No. 368,765
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

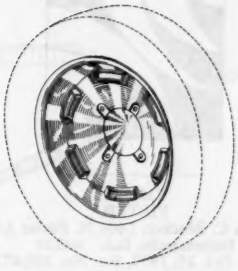
235,537
AUXILIARY HOUSING FOR USE WITH PICKUP TRUCKS
Thomas E. Haynes, 3701 NW. 42nd, Oklahoma City, Okla. 73112
Filed July 30, 1973, Ser. No. 383,686
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

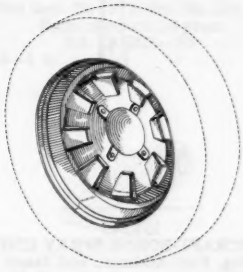


235,538
PAD ANTI-RATTLE SPRING FOR A DISC BRAKE
Hermann Brix, Koblenz, Germany, assignor to Girling Limited, Birmingham, England
Filed Jan. 15, 1973, Ser. No. 323,418
Claims priority, application Great Britain July 13, 1972
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—180



235,539
WHEEL COVER
Sture Lennart Asberg, Partille, Sweden, assignor to SKF Nova AB, Goteborg, Sweden
Filed June 20, 1973, Ser. No. 371,580
Claims priority, application Sweden Dec. 18, 1972
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—206



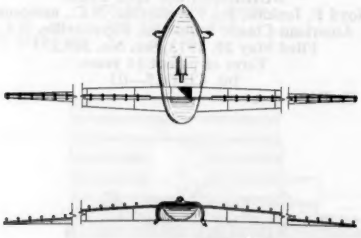


235,540
BUILDING OR THE LIKE
Floyd P. Jenkins, Jr., Fayetteville, N.C., assignor to American Classic Industries, Fayetteville, N.C.
Filed May 30, 1973, Ser. No. 365,272
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

235,541
TILE
Stephan Eusemann, Nurnberg, Germany, assignor to Dynamit Nobel Aktiengesellschaft
Filed June 13, 1972, Ser. No. 262,180
Claims priority, application Germany Dec. 13, 1971
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 B

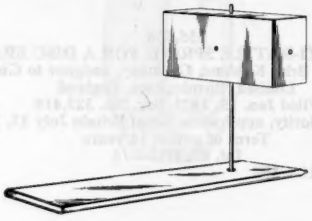
235,542
FILTER
William C. Blocker, 1406 N. Butler Ave., Indianapolis, Ind. 46219
Filed Oct. 25, 1972, Ser. No. 300,472
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

235,543
AIRCRAFT-BORNE SPRAY UNIT
Richard Werling, Fort Atkinson, and James P. Lindsey, Janesville, Wis., assignors to Omniflight Helicopters, Inc., Janesville, Wis.
Filed May 17, 1973, Ser. No. 361,263
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

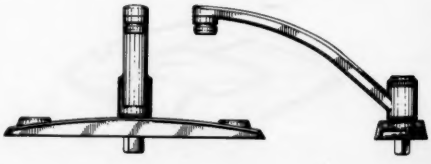


235,544
GARDEN SPRAYER
Jacob R. Bippus, Pittsburgh, and Raymond Kazusky, Jr., Jeannette, Pa., and Edward D. Levy, Spring Valley, N.Y., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Filed Nov. 28, 1973, Ser. No. 419,699
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

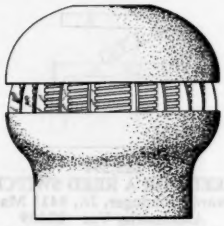
235,545
FLOAT VALVE
Quentin T. Cox, 1216 W. 226th St., Torrance, Calif. 90502
Filed Apr. 16, 1973, Ser. No. 351,777
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



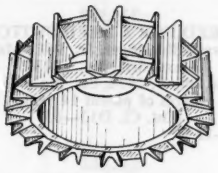
235,546
FAUCET FIXTURE BODY
Harper Landell, Fort Washington, Pa., assignor to Speakman Company
Filed Aug. 3, 1972, Ser. No. 277,663
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32



235,547
AIR PURIFIER
Georg Schimanski, Rummenohl, Germany, assignor to Globol-Werk GmbH, Neuburg (Danube), Germany
Filed Sept. 17, 1973, Ser. No. 398,058
Claims priority, application Germany July 13, 1973
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149



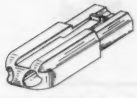
235,548
INJECTION NOZZLE RIM FOR VENTILATING APPARATUS
Jorgen Holt, Naestved, Denmark, assignor to Nordisk Ventilator Co. Aktieselskab, Naestved, Denmark
Filed July 27, 1973, Ser. No. 383,326
Claims priority, application Denmark Feb. 1, 1973
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



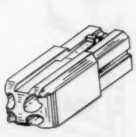
235,549
DENTAL TONGUE RETRACTOR
Ervin M. Funderburk, 1648 Providence Road, Charlotte, N.C. 28806
Filed Apr. 12, 1974, Ser. No. 460,293
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 D

235,550
DENTAL BLADE PROBE TOOL
Robert Philip Berger, 17110 Clemons Drive, Encino, Calif. 91316
Filed Dec. 29, 1969, Ser. No. 20,651
Term of patent 14 years
The term of this patent subsequent to Feb. 24, 1986, has been disclaimed
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

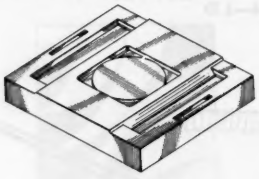
235,551
ELECTRICAL CONNECTOR
Paul "B" Derr, Middletown, Gilbert Douglas Ferdon, Hummelstown, and Robert George Harwood, Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 29, 1972, Ser. No. 293,625
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



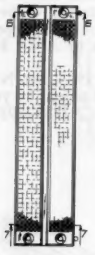
235,552
ELECTRICAL CONNECTOR
Paul "B" Derr, Middletown, Gilbert Douglas Ferdon, Hummelstown, and Robert George Harwood, Mechanicsburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 29, 1972, Ser. No. 293,639
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



235,553
CONNECTOR PACKAGE
James Raymond Kunkle, Enola, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 20, 1973, Ser. No. 333,580
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



235,554
ELECTRICAL SOCKET
Ronald J. Portugal, North Haven, Conn., assignor to Continental Specialties Corporation, New Haven, Conn.
Filed Nov. 8, 1973, Ser. No. 413,919
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B

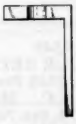


235,555
POWER OUTLET PEDESTAL BOX
Merle A. Plummer, North Hollywood, Calif., assignor to Myers Electric Products, Inc., Montebello, Calif.
Filed Aug. 4, 1972, Ser. No. 278,088
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 R

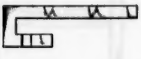
235,556
REED FOR A REED SWITCH
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,883
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

235,557
REED FOR A REED SWITCH
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,886
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

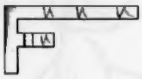
235,558
REED FOR A REED SWITCH
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,889
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



235,559
REED FOR A REED SWITCH
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,891
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

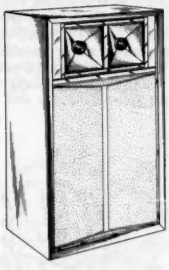


235,560
REED FOR A REED SWITCH
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,892
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

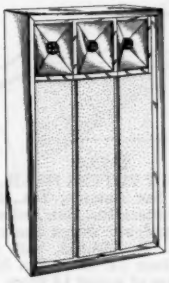


235,561
REED FOR A REED SWITCH
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 9, 1974, Ser. No. 486,893
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

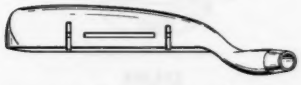
235,562
HORN SPEAKER
Arthur Robson, Jericho, N.Y., assignor to Morse Electro Products Corp., Brooklyn, N.Y.
Filed Aug. 13, 1973, Ser. No. 388,331
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 G



235,563
HORN SPEAKER
Arthur Robson, Jericho, N.Y., assignor to Morse Electro Products Corp., Brooklyn, N.Y.
Filed Aug. 13, 1973, Ser. No. 388,332
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 G

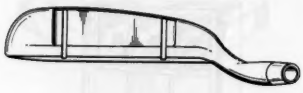


235,564
GOLF PUTTER HEAD
Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.
Filed Sept. 29, 1972, Ser. No. 293,526
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

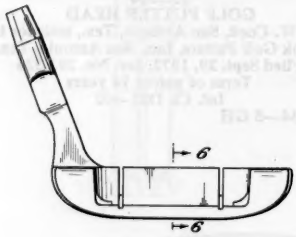


235,565
PUTTING AID ATTACHMENT FOR A GOLF CLUB SHAFT
Anthony J. Prisco, Sr., Woodcliff Lake, N.J. (102 Beech St., Westwood, N.J. 07675)
Filed Aug. 27, 1973, Ser. No. 391,739
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

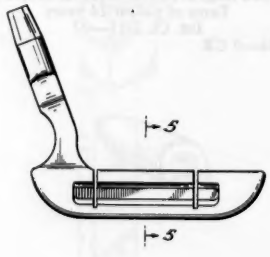
235,566
GOLF PUTTER HEAD
Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.
Continuation of abandoned design applications Ser. No. 293,526, Sept. 29, 1972, and Ser. No. 343,387, Mar. 21, 1973. This application June 14, 1974, Ser. No. 479,452
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



235,567
GOLF PUTTER HEAD
Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.
Continuation of abandoned design applications Ser. No. 293,523 and Ser. No. 293,528, both Sept. 29, 1972. This application June 14, 1974, Ser. No. 479,457
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

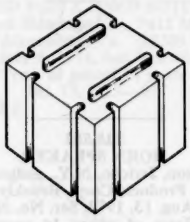


235,568
GOLF PUTTER HEAD
Raymon W. Cook, San Antonio, Tex., assignor to Ray Cook Golf Putters, Inc., San Antonio, Tex.
Continuation of abandoned design applications Ser. No. 293,531, Sept. 29, 1972, and Ser. No. 343,389, Mar. 21, 1973. This application June 14, 1974, Ser. No. 479,459
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

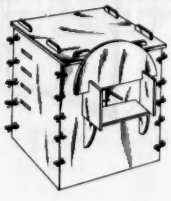


235,569
TOY BANK
Angelo L. De Fina, 2882 86th St., Brooklyn, N.Y. 11223
Filed Sept. 20, 1973, Ser. No. 399,105
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R

235,570
TOY CONSTRUCTION PIECE
Stanley Ernest Barton, McKinnon, Victoria, Australia, assignor to Rosenhain and Lipmann Pty. Limited, Richmond, Victoria, Australia
Filed Apr. 3, 1973, Ser. No. 347,511
Claims priority, application Australia Nov. 22, 1972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 GG



235,571
TOY HOUSE
Gertrude Klara Maria Jaros, Forlandegatan 5, S–415 06 Goteborg, Sweden
Filed May 22, 1973, Ser. No. 362,876
Claims priority, application Sweden Nov. 22, 1972
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL

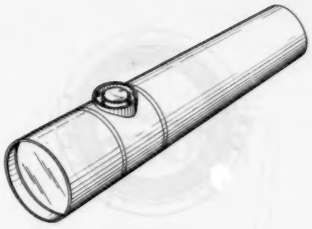


235,572
CROSS PENDANT OR THE LIKE
Karl Edward Guetzlaff, 1173 Dixon Drive, Waterloo, Iowa 50701
Filed Oct. 10, 1973, Ser. No. 404,985
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 B

235,573
LAMP
Alfred Brych, Chasneuil, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction
Filed June 3, 1974, Ser. No. 475,993
Claims priority, application France Dec. 3, 1973
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

235,574
HEAD SUPPORTED FLASHLIGHT
Donald E. Willis, 621 W. State St., Rockford, Ill. 61101, and Robert P. Hohm, Rockford, Ill.; said Hohm assignor to said Willis
Filed Sept. 4, 1973, Ser. No. 393,949
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

235,575
FLASHLIGHT
Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Mar. 22, 1973, Ser. No. 343,707
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



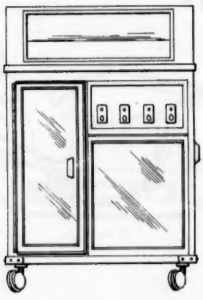
235,576
COMBINED RADIO AND FOOD SERVICE DISH
Morris Fink, Great Neck, N.Y.
Filed July 11, 1973, Ser. No. 378,345
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

235,577
PAIR OF SPECTACLES
Larry G. Loughner, North Andover, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Oct. 19, 1972, Ser. No. 298,894
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

235,578
LENS CAP OR SIMILAR ARTICLE
Kenichi Miyake, Osaka, and Masakazu Nakanishi, Hashimoto, Japan, assignors to Minolta Camera Kabushiki Kaisha, Higashi-ku, Osaka, Japan
Filed Dec. 20, 1973, Ser. No. 426,731
Claims priority, application Japan June 22, 1973
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 E

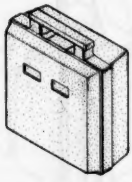
235,579
TYPEWRITER
Alejandro De Tomaso and Thom Tjaarda, Turin, Italy, assignors to SCM Corporation, New York, N.Y.
Filed Oct. 25, 1972, Ser. No. 300,534
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

235,580
PORTABLE HOSPITAL EMERGENCY LIFE SUPPORT SYSTEM
Robert D. Miller, Berkeley, Calif., assignor to Hospital Systems, Inc., Oakland, Calif.
Filed June 22, 1973, Ser. No. 372,662
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D83—1 F

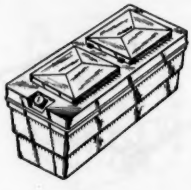


235,581
SUNBATHING PLATFORM
Charles W. Gage, 545 Manchester Drive, South Bend, Ind. 46615
Filed Jan. 24, 1973, Ser. No. 326,494
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 C

235,582
CASE FOR REFRIGERATION TEST INSTRUMENTS OR THE LIKE
Raymond M. Beck, Los Angeles, Calif., assignor to Mechanical Refrigeration Enterprises, North Hollywood, Calif.
Filed June 1, 1973, Ser. No. 366,172
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

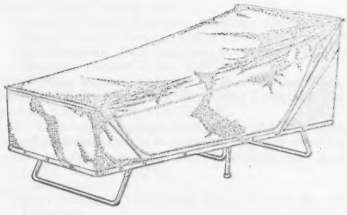


235,583
COMBINED VEHICLE AUXILIARY FUEL TANK AND UTILITY COMPARTMENT
Alan C. Parry, Des Moines, Iowa, assignor to Mid-America Body & Equipment Co., Inc.
Filed May 7, 1973, Ser. No. 358,006
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



235,584
KEY HOLDER
Edward M. Hall, 2053 W. Cocopah, Phoenix, Ariz. 85009
Filed Nov. 7, 1973, Ser. No. 413,585
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8

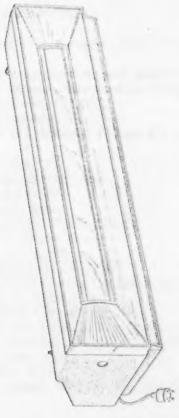
235,585
COT-TENT
Dale W. Stevens, 3998 Oliver Drive, Salt Lake City, Utah 84117
Filed Sept. 14, 1973, Ser. No. 397,254
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D88—3 B



235,586
RAZOR
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Filed June 4, 1973, Ser. No. 366,664
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

235,587
SIGNBOARD
Jefferson D. Muse, 156 Forsythe St. SW., Atlanta, Ga. 30306
Filed Jan. 14, 1974, Ser. No. 433,349
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12

235,588
ELECTRICAL LIGHTING APPARATUS FOR DISPLAYING ADVERTISING MESSAGES ON A ROTARY DRUM
Jakob Asam, Merano, Italy, assignor to Informa S.R.L., Merano, Bolzano, Italy
Filed Dec. 20, 1972, Ser. No. 316,767
Claims priority, application Italy June 21, 1972
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



A. Duda
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A-Lok Co
Ditch
AB Bofor
Aldri
AB Telep
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Abbott L
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Kolib
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58-57.5
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Wiklu
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Fradin
Agency of
Kobay
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Sunah
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Van
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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Duda & Sons, Inc.: *See—*
Boots, Vernie A., 3,890,909.

A.G. fur industrielle Elektronik AGIE: *See—*
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,891,819.

A. H. Robins Company, Incorporated: *See—*
Lunsford, Carl Dalton; and Cale, Albert Duncan, Jr., 3,891,646.

A-Lok Corporation: *See—*
Ditcher, John, 3,891,224.

AB Bofors: *See—*
Aldrin, Henry Wilhelm, 3,890,731.

AB Teleplan: *See—*
Petrusson, Erling Olav Valdemar, 3,891,930.

Abbott Laboratories: *See—*
Mehta, Shashi Pal, 3,891,755.
Standley, Wendell Evert; and Beall, Glenn Lee, 3,890,972.
Swett, Leo Ralph, 3,891,630.

Abbott, William S.: *See—*
Lipe, Gordon C.; and Abbott, William S., 3,891,986.

Abdallah, Abdulmuniem H.: *See—*
Shea, Philip J.; and Abdallah, Abdulmuniem H., 3,891,769.

Abe, Michiharu: *See—*
Yasumori, Akiyoshi; Ohta, Katsuichi; Kunikane, Makoto; and Abe, Michiharu, 3,891,513.

Abe, Toshizo; Sakamoto, Seiho; Go, Shigeo; Maekuma, Koichi; Yamada, Yoshitaka; and Hirashima, Yasumasa, to Mitsubishi Chemical Industries Ltd. Process for polymerizing olefins. 3,891,611, Cl. 260-88.20B.

Abeta, Sadaharu, to American Cyanamid Company. Basic dye-bath and method for dyeing acrylic fibers therewith. 3,891,390, Cl. 8-173.000.

Abrashev, Georgi Ivanov: *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.

Ackroyd, John Morton; and Hart, Graham Arthur Nigel, to Firestone Burleigh Marine Pneumatic Fendering Company Limited. Marine fenders. 3,890,917, Cl. 114-220.000.

Adachi, Kazuma; Tokunaga, Masayoshi; and Takeshita, Shigeru, to Kabushiki Kaisha Daikin Seisakusho. Impeller wheel for torque converter or fluid coupling and manufacturing method thereof. 3,891,350, Cl. 4 .-180.000.

Adage, Inc.: *See—*
Cheek, Thomas B.; Thornhill, Daniel E.; and Stewart, Ronald B., 3,891,982.

Adams-Russell Co., Inc.: *See—*
Norton, David E.; and Podell, Allen F., 3,891,934.

Addressograph-Multigraph Corporation: *See—*
Brugge, Walter James; and Takacs, Edward Francis, 3,890,899.
Kolibas, James Andrew, 3,891,315.

Advance Value Installations Inc.: *See—*
Blazek, George A., 3,891,146.

Aerojet-General Corporation: *See—*
Allemann, James G., 3,891,956.
Lista, Edwin L.; and Williams, Kenneth S., 3,890,877.

Aeschmann, Marc, to Ebauches S.A. Watch stem intermediate setting position with functions determined by whether intermediate position was achieved by pushing stem in or pulling stem out. 3,890,778, Cl. 58-57.500.

AG International: *See—*
Hoff, John K.; and Goss, John B., 3,891,150.

AGA Aktiebolag: *See—*
Mogensen, Palne; and Kaij, Mats J., 3,891,562.
Wiklund, Klas Rudolf, 3,891,857.

Agence National de Valorization de la Researche (ANVAR): *See—*
Fradin, Maurice, 3,890,674.

Agency of Industrial Science & Technology: *See—*
Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, 3,891,574.
Sunahara, Hiroshi; and Kimura, Yoshio, 3,891,205.

Agfa-Gavaert Aktiengesellschaft: *See—*
Van Paesschen, August Jean; and Herbots, Joseph Antoine, 3,891,444.

Agfa-Gevaert Aktiengesellschaft: *See—*
Deml, Reinhold; Greis, Ulrich; Bestenreiner, Friedrich; and Helmberger, Josef, 3,891,975.

Agfa-Gevaert, N.V.: *See—*
Bollen, Romain Henri; and Van Esch, Robert Florent, 3,891,852.

Ahmed, Abbas Mesbahuddin, to AMP Incorporated. Discharge display panel including a substrate supporting plural cathodes and recessed anodes. 3,891,883, Cl. 313-54.000.

Air Preheater Company, Inc., The: *See—*
Mahoney, Robert E., 3,891,029.

Aisin Seiki Kabushiki Kaisha: *See—*
Kawai, Taneichi; and Nishida, Koji, 3,890,734.

Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, to Canon Kabushiki Kaisha. Electrical driving device for film mechanism. 3,891,312, Cl. 352-180.000.

Aker, John L., to Kustom Electronics, Inc. Variable frequency oscillator including active band-pass filter with positive feedback. 3,891,946, Cl. 331-108.00D.

Akita, Sigeyuki, to Nippon Soken, Inc. Power and signal transmitting means. 3,891,914, Cl. 321-47.000.

Aktiebolaget Atomenergi: *See—*
Margen, Peter Heinrich Erwin, 3,890,787.

Aktiebolaget Hassle: *See—*
Carlsson, Per Arvid Emil; and Corrodi, Hans Rudolf, 3,891,768.

Aktiengesellschaft Brown, Boveri & Cie.: *See—*
Sahm, Peter; and Sebalj-Novosel, Renata, 3,891,431.

Aktiengesellschaft Gebruder Loepfe: *See—*
Domig, Rene, 3,890,810.

Alacchi, Georges. Walking-props for mining galleries. 3,890,792, Cl. 61-45.00D.

Albert & Rowland S.A.: *See—*
Valette, Raymond, 3,891,654.

Alcanzare, Eduardo V. Detachable trash box and trailer. 3,891,106, Cl. 214-318.000.

Aldred, Peter: *See—*
Allen, Robert E.; Bartos, Jon L.; and Aldred, Peter, 3,890,816.

Aldrin, Henry Wilhelm, to AB Bofors. Method of and device for extracting cartridge cases. 3,890,731, Cl. 42-25.000.

Alewitz, Sam, to Perfection Corporation. Anode-fitting assembly. 3,891,530, Cl. 204-197.000.

Allaben, Charles M., Jr.: *See—*
Zimmer, George A; Allaben, Charles M., Jr.; and Weidman, William K., 3,891,286.

Allardyce, Gordon E.; Amedee, Roy; and Belleau, Claude, to Chrysler Corporation. Method of preparing oxidation resistant brazed joints. 3,891,784, Cl. 427-295.000.

Allemann, James G., to Aerojet-General Corporation. Apparatus for measuring variables. 3,891,956, Cl. 337-1.000.

Allen, Bill. Trailer hitch. 3,891,237, Cl. 280-477.000.

Allen, Robert E.; Bartos, Jon L.; and Aldred, Peter, to General Electric Company. Elimination of carbide segregation to prior particle boundaries. 3,890,816, Cl. 75-0.5BA.

Allen, Robert P.; and Hagemeyer, Hugh J., Jr., to Eastman Kodak Company. Production of 2,2-disubstituted propiolactones. 3,891,679, Cl. 260-343.900.

Allen, Thomas E.; and Smith, Don W., to CMI Corporation. Dual pressure control assembly. 3,890,783, Cl. 60-420.000.

Allied Chemical Corporation: *See—*
Damon, William H., 3,891,233.
Sundie, Richard D.; and Pennie, Walter L., 3,891,590.

Allis-Chalmers Corporation: *See—*
Clark, Thomas F., 3,891,862.
Jenness, Raymond C., 3,891,281.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Henze, Michael, 3,890,834.

Alza Corporation: *See—*
Higuchi, Takeru, 3,891,757.

Amax Inc.: *See—*
Scarpino, Leopoldo, 3,891,894.

Amedee, Roy: *See—*
Allardyce, Gordon E.; Amedee, Roy; and Belleau, Claude, 3,891,784.

Amelio, Gilbert F.; Livezey, Jack A.; and Salsbury, Phillip J., to Fairchild Camera and Instrument Corporation. Charge coupled memory device. 3,891,977, Cl. 340-173.00R.

American Air Filter Company, Inc.: *See—*
Kannapell, David H.; Schupp, Philipp P.; and Amrein, David, 3,891,248.
Revell, Alan E., 3,891,253.

American Aniline Products, Inc.: *See—*
Genta, Guido R., 3,891,691.

American Can Company: *See—*
Schane, Alvin Mansfield, 3,891,116.

American Cyanamid Company: *See—*
Abeta, Sadaharu, 3,891,390.
Breuer, Charles Benedict, 3,891,507.

American Flange & Manufacturing Co., Inc.: *See—*
Laurizio, Jeremiah J., 3,891,118.

American Home Products Corporation: *See—*
Sellstedt, John H.; and Wolf, Milton, 3,891,643.
Teller, Daniel M.; Guinosso, Charles J.; Bell, Stanley C.; and Douglas, George H., 3,891,665

American Standard, Inc.: *See—*
Ishman, Neal H.; Lenert, Richard W.; and Goldman, Jeffrey B., 3,891,926.

Ameron, Inc.: *See*—
Bordner, Dalton W.; and Kline, Harlan H., 3,891,489.
Ames Rubber Corporation: *See*—
Lawson, Richard, 3,891,739.
Amor, William H., Jr.; and Stancliff, Robert E., to Picker Corporation. Mount for ceiling supported X-ray tube. 3,891,856, Cl. 250-523.000.
AMP Incorporated: *See*—
Ahmed, Abbas Mesbahuddin, 3,891,883.
Bakermans, Johannes Cornelis Wilhelmus, 3,891,012.
Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., 3,891,013.
House, William James, 3,891,075.
Lawson, Gustaf Rudolph; and Stuart, John H., 3,890,858.
Swengel, Robert Charles, Sr.; and Crumley, J. A., 3,891,789.
Amrein, David: *See*—
Kannapell, David H.; Schupp, Philipp P.; and Amrein, David, 3,891,248.
Anderson, Bruce W., to Bendix Corporation, The. Keyway drive for multiple disc brake. 3,891,066, Cl. 188-73.200.
Anderson Company, The: *See*—
Mason, John A., 3,890,667.
Anderson, Matthew E.; and Redmond, Stephen L., to United States of America, Navy. Digital electronic safety and arming system. 3,890,901, Cl. 102-70.20R.
Anderson, Paul L., to Sandoz, Inc. Terephenylyl-butadienols. 3,891,716, Cl. 260-618.00R.
Anderson, William J. Closet rod. 3,891,091, Cl. 211-105.300.
Ando, Noriaki: *See*—
Yaeda, Yasuyuki; Chikatsu, Yoshishige; Ando, Noriaki; and Sakata, Ryuichi, 3,891,724.
Ando, Noriyoshi: *See*—
Oishi, Kazuo; Ando, Noriyoshi; and Yoshida, Hiroshi, 3,890,938.
Anglada, Norberto Puig. Knitting machines. 3,890,804, Cl. 66-50.00R.
Angruner, Herbert, to Bunzl and Biach Aktiengesellschaft. Method of laying webs of composite material containing plant seed. 3,890,910, Cl. 111-1.000.
Angus, John H., to Westinghouse Electric Corporation. Overhead traveling crane with a telescopic hoist drive. 3,891,094, Cl. 212-20.000.
Anthony, David W.: *See*—
Caputo, Arnold P.; Anthony, David W.; and Pickett, William H., 3,890,751.
Apparatebau Rothemuhle Brandt & Kritzler: *See*—
Schluter, Siegfried Hans-Dietmar; and Kraft, Erich, 3,891,030.
Arai, Atsuaki; and Oishi, Yasushi, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive materials. 3,891,445, Cl. 96-100.000.
Araki, Mikio: *See*—
Shoda, Hiroshi; and Araki, Mikio, 3,891,835.
Ardezzone, Frank J.; and Englert, Thomas A., to Probe Rite, Inc. Adjustable multi-point probe head assembly. 3,891,924, Cl. 324-158.00P.
Areschka, Alex: *See*—
Descamps, Marcell; and Areschka, Alex, 3,891,648.
Argenio, Domenic. Water dilutable transfer ink compositions. 3,891,581, Cl. 260-16.000.
Aries, Robert. Stabilized slow release DDUP composition. 3,891,759, Cl. 424-219.000.
Armco Steel Corporation: *See*—
Burwick, Edward R., 3,891,518.
Christ, Frederick C., 3,891,356.
Arnold, Raymond Mills; and Stubbings, Alec Walter George. Transfer materials. 3,891,242, Cl. 283-6.000.
Arnold, Richard H.: *See*—
Meador, Richard A.; Arnold, Richard H.; and Paap, Hans J., 3,891,916.
Arthur, Jett C., Jr.; and Bains, Malkait S., to United States of America, Agriculture. Carbohydrate-boron alkoxide compounds. 3,891,621, Cl. 260-210.00R.
Artisan Industries Inc.: *See*—
Baird, James L., 3,891,495.
Asahi Broadcasting Corporation: *See*—
Kimura, Hisao, 3,891,792.
Asai, Osamu: *See*—
Hanazono, Masanobu; Asai, Osamu; and Kawakami, Kanji, 3,891,995.
Aschermann, Wilfried: *See*—
Bockelmann, Paul; and Aschermann, Wilfried, 3,891,937.
Ashworth, Denis Henry, to Simon Engineering Dudley Limited. Hydraulically elevatable platforms. 3,891,056, Cl. 182-148.000.
Aspelin, Gary Bertil; Caffrey, Richard Francis; and Lauer, William, to Johnson & Johnson. Anti-fog surgical face mask with slits. 3,890,966, Cl. 128-146.200.
Athenes, Claude: *See*—
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 3,891,807.
Athlone Industries, Inc.: *See*—
Simon, Jack, 3,890,679.
Atkinson, James L., to Rockwell International Corporation. Electrostatic bearing sensing and control circuitry. 3,891,285, Cl. 308-10.000.
Atlantic Richfield Company: *See*—
Rosenthal, Rudolph; and Kieras, Joseph A., 3,891,748.
Atlas Copco Aktiebolag: *See*—
Lagerstrom, Gunnar, 3,891,039.
Atwal, Manmohan Singh: *See*—
Diassi, Patrick Andrew; and Atwal, Manmohan Singh, 3,891,629.
Atzinger, Wolfgang, to Fritz Schwarzer GmbH. Pivoted armature instrument for an electromagnetic recording system. 3,891,922, Cl. 324-151.00R.
Auborn, James J., to GTE Laboratories Incorporated. Electrochemical cell. 3,891,457, Cl. 136-6.0LN.
Auer, Robert Thomas; Campbell, Laurie Jay; Lohr, Raymond J.; and Smith, James, to Marx Toys Division of The Quaker Oats Company. Toy vehicle for transporting at least the vehicle operator. 3,891,234, Cl. 280-211.000.
Auer, Siegfried O.: *See*—
United States of America, National Aeronautics and Space Administration; and Auer, Siegfried O., 3,891,851.
Augat, Inc.: *See*—
Damon, Neil F., 3,891,898.
August Bilstein, Firma: *See*—
Willich, Jean Herbert; and Pfeil, Christian, 3,891,199.
Auker, Byron H.: *See*—
United States of America, National Aeronautics and Space Administration; Levin, Herman; Auker, Byron H.; and Gardos, Michael N., 3,891,452.
Auriat, Edouard; and Gaudard, Yves, to Rhone-Poulenc-Textile. Reinforced dike. 3,890,802, Cl. 61-30.000.
Austral-Erwin Engineering Co.: *See*—
Erwin, Ransome W., 3,891,496.
Automation General: *See*—
Gallant, Terry B., 3,891,900.
Automobiles Peugeot: *See*—
Haurat, Edouard; and Bouclet, Roland, 3,890,723.
Pruvot, Francois C., 3,891,283.
Automotive Products Co., Ltd.: *See*—
Bainbridge, Wilfred Nicholas; and Parsons, David, 3,891,241.
Auxier, Thomas A., to General Electric Company. Turbine blade with increased film cooling. 3,891,348, Cl. 416-97.000.
Avalon Industries, Inc.: *See*—
Berman, Morton, 3,891,179.
Avery, Carl Frederick, to Marion Health & Safety, Inc. Unit for dispensing liquid from a frangible ampoule. 3,891,331, Cl. 401-132.000.
Axelsson, Lars Bengt, to Svenska Aktiebolaget Bromsregulator. Clearance-sensing slack adjuster for a vehicle brake-actuating pneumatic cylinder-piston unit. 3,891,067, Cl. 188-196.00D.
Aylard, William F.: *See*—
Winter, Richard M.; and Aylard, William F., 3,891,952.
Ayres, Waldemar A., to Becton, Dickinson and Company. Centrifuge. 3,891,140, Cl. 233-26.000.
Ayres, Waldemar A., to Becton, Dickinson and Company. Serum and plasma separator — constrictionless type. 3,891,553, Cl. 210-136.000.
Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., to USM Corporation. Automatic hemming machine. 3,890,911, Cl. 112-121.120.
Bachor, Jurgen: *See*—
Sewing, Gerhard; and Bachor, Jurgen, 3,890,670.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Danneil, Axel; Flickinger, Erich; Graefje, Heinz; Plass, Reinhold; and Schnur, Rudolf, 3,891,511.
Bain, Brian MacDonald: *See*—
Phillipps, Gordon Hanley; Bain, Brian MacDonald; and Durrant, Graham, 3,891,631.
Bainbridge, Wilfred Nicholas; and Parsons, David, to Automotive Products Co., Ltd. Vehicle suspension systems. 3,891,241, Cl. 280-124.00F.
Bains, Malkait S.: *See*—
Arthur, Jett C., Jr.; and Bains, Malkait S., 3,891,621.
Baird, James L., to Artisan Industries Inc. Method and apparatus for recovering powders from liquids. 3,891,495, Cl. 159-6.0WH.
Baker, Richard J.; Miller, Timothy A.; Erlinger, Gary K.; Loepiktie, Stephanus F.; and Hanselman, Larry R., to Ralston Purina Company. Soft textured dry protein product and method for forming same. 3,891,774, Cl. 426-104.000.
Bakermans, Johannes Cornelis Wilhelmus, to AMP Incorporated. Apparatus for applying ties to bundles. 3,891,012, Cl. 140-93.00A.
Ballast-Nedam Group N.V.: *See*—
De Koning, Jan; and Van Der Veen, Romke, 3,890,791.
Balm Paints Limited: *See*—
Kershaw, Robert William; Lubbock, Frederick John; and Polgar, Livia, 3,891,577.
Balzer, Russell R.: *See*—
Kuxhouse, Benjamin; and Balzer, Russell R., 3,890,989.
Banbury Buildings Holdings Limited: *See*—
Bolton, Frank Edmund, 3,890,752.
Bar-On, Ari, to Xerox Corporation. Sheet stripping apparatus. 3,891,206, Cl. 271-174.000.
Bar Productions (Bromsgrove) Limited: *See*—
Showell, Richard G. D., 3,890,903.
Barber-Greene Company: *See*—
Smith, Fred T.; Munyon, Julian M.; and Gebhardt, James J., Jr., 3,891,338.
Barco International Corporation of Texas: *See*—
Paranto, Archie V., 3,891,122.
Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Bumper for motor vehicles. 3,891,258, Cl. 293-98.000.
Barenyi, Bela: *See*—
Wilfert, Karl; Barenyi, Bela; and Renner, Hermann, 3,891,266.
Barker, June N.: *See*—
Youdin, Myron; Barker, June N.; and Reich, Theobald, 3,890,959.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Lenk, Erich, 3,891,379.

Barnas, Eugene: *See*—
Richter, Sidney B.; and Barnas, Eugene, 3,891,701.

Barnas, Eugene F.: *See*—
Richter, Sidney B.; and Barnas, Eugene F., 3,891,687.

Barnes, Derek Leonard. Tables for playing games. 3,891,074, Cl. 194-1.00R.

Barnett, Richard E.: *See*—
Woodrum, Guy Thomas; and Barnett, Richard E., 3,891,708.

Barney, Kay H.; and Lester, John M., to Sperry Rand Corporation. Radar confusion countermeasure system. 3,891,989, Cl. 343-18.00E.

Barozzi, Gian Piero; and Horeschi, Giancarlo, to Citizen Watch Company Limited. Device for calculating machines wherein the platen is tapped against the types, to allow for an uniform impression thereof. 3,891,142, Cl. 235-58.00P.

Barquero, Joaquin Gomez. Combined system of optical devices for photography and stereoscopic vision. 3,891,303, Cl. 350-132.000.

Barr, Thomas A., Jr.: *See*—
Roberts, Thomas G.; Barr, Thomas A., Jr.; and Rust, Charles M., 3,891,941.

Barraclough, Ronald: *See*—
Langley, Robert; and Barraclough, Ronald, 3,891,455.

Barraco, Anthony J. Ionization gauge. 3,891,882, Cl. 313-7.000.

Barron, Morton A.: *See*—
Ryan, Maurice A.; and Barron, Morton A., 3,891,323.

Barry, David Edward; and Steigmann, Peter Edward, to English Electric Valve Company Limited. Semiconductor devices. 3,891,887, Cl. 315-3.000.

Bartelink, Everhard H. B., to Northeast Electronics Corporation. Apparatus and method for augmenting a telephone network. 3,891,802, Cl. 179-2.00A.

Bartholomaus, Reiner; Bernd, Hubert; and Liedhegener, Friedel, to G. L. Rexroth GmbH. Hydraulic tracking valve for templates in machine tools or the like. 3,891,145, Cl. 137-625.600.

Bartos, Jon L.: *See*—
Allen, Robert E.; Bartos, Jon L.; and Aldred, Peter, 3,890,816.

BASF Aktiengesellschaft: *See*—
Heil, Eduard; Kuchner, Karl; Sliwka, Wolfgang; and Smits, Harald, 3,891,603.
Petersen, Harro; Erhard, Paulus; Queins, Hubertus; and Schoeppl, Hubert, 3,891,608.

BASF Wyandotte Corporation: *See*—
Cenker, Moses; and Narayan, Thirumurti L., 3,891,579.
Kan, Peter T.; and Cenker, Moses, 3,891,578.

Bassani, Giancarlo, to Decio Maraglio. Set of interconnectable pressure elements for making construction models. 3,890,738, Cl. 46-16.000.

Battaerd, Hendrik Adrian Jacobus; Bolto, Brian Alfred; and Shah, Pir Ghulam Samadani, to ICI Australia Limited; and Commonwealth Scientific and Industrial Research Organization. Process. 3,891,576, Cl. 260-2.10R.

Battelle Development Corporation: *See*—
Russell, James T., 3,891,794.

Bauer, Friedrich, to Metabowerke KG Closs, Rauch, & Schnitzler. Compass saw. 3,890,708, Cl. 30-393.000.

Bauer, Kurt; Findeiss, Helmut; and Krempel, Alfred, to Haarmann & Reimer GmbH. Process for the extraction of hops. 3,891,781, Cl. 426-429.000.

Baum, John W., to Zoecon Corporation. Phenoxy containing branched chain alkyl sulfides. 3,891,714, Cl. 260-609.00F.

Baxter Laboratories, Inc.: *See*—
Fischel, Halbert, 3,890,969.
Kremen, Jerome C.; and Landa, Isaac, 3,891,853.
Leonard, Ronald J.; and Takagishi, Jonathan Wayne, 3,891,416.

Bayer Aktiengesellschaft: *See*—
Kuhn, Rainer; and Schon, Nikolaus, 3,891,607.
Lorenz, Walter; and Hammann, Ingeborg, 3,891,642.
Neeff, Rutger, 3,891,388.
Rudolph, Hans; Heine, Hans-Georg; Fuhr, Karl; and Schnell, Hermann, 3,891,524.
Runte, Helmut; and Schwartz, Peter, 3,890,685.
Schirmer, Hermann; Peilstocker, Gunter; and Schuster, Herbert, 3,891,719.
Sommer, Richard; Wiesel, Manfred; Otten, Hans-Gunter; and Siegel, Edgar, 3,891,619.
Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 3,891,718.

Bazell, Seymour; Ostensen, Ralph G.; and Goldberg, Edward M., to Medical Products Corporation. Catheter tip assembly. 3,890,976, Cl. 128-351.000.

BBC Brown Boveri & Company: *See*—
Britsch, Helmut, 3,891,880.

Beal, Robert Eugene. Protective device for use by player of a hardball game, particularly baseball. 3,890,648, Cl. 2-20.000.

Beall, Glenn Lee: *See*—
Standley, Wendell Evert; and Beall, Glenn Lee, 3,890,972.

Bearden, Richard D., Jr. Portable rescue device. 3,891,187, Cl. 254-93.00R.

Beatrice Foods Company: *See*—
Dian, Walter, 3,890,847.

Beavers, Dorothy Johnson, to Eastman Kodak Company. Lithographic materials containing metal complexes. 3,891,442, Cl. 96-76.00R.

Bebinger, Jack E., to White-Westinghouse Corporation. Low pressure liquid dispensing valve. 3,891,180, Cl. 251-120.000.

Becker, Alan M.; Epstein, Joseph A.; Lupin, Michael S.; and Zolotov, Shaul, to Dead Sea Works Ltd. Process for the separate recovery of potassium chloride and sodium chloride from a solid mixture thereof. 3,891,544, Cl. 209-166.000.

Beckmann, Georg; and Gilli, Paul Viktor, to Waagner-Biro Aktiengesellschaft. Thermal power plants. 3,890,789, Cl. 60-659.000.

Becton, Dickinson and Company: *See*—
Ayres, Waldemar A., 3,891,140.
Ayres, Waldemar A., 3,891,553.

Beesch, Otto, to Robert Bosch G.m.b.H. Electrochemical oxygen sensor, especially for motor exhaust gas analysis. 3,891,529, Cl. 204-195.00S.

Beeston, John Wilmot; Bryant, Greyham Frank; and Spooner, Peter David, to Gec-Elliott Automation Limited. Methods of rolling strip materials, and strip materials rolled thereby. 3,890,817, Cl. 72-6.000.

Bell & Howell Company: *See*—
Hideo, Hirokawa; and Yoshiaki, Mizuki, 3,891,310.

Bell, Stanley C.: *See*—
Teller, Daniel M.; Guinosso, Charles J.; Bell, Stanley C.; and Douglas, George H., 3,891,665.

Bell Telephone Laboratories, Incorporated: *See*—
Hachenburg, Victor, 3,891,804.
Melhose, Alfred E., 3,891,799.

Bellan, Alfred; and Deneke, Klaus, to Dynamit Nobel AG. Process for producing basic aluminum chlorides. 3,891,745, Cl. 423-462.000.

Bellanger, Maurice Georges: *See*—
Daguet, Jacques Lucien; Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, 3,891,803.

Belleau, Claude: *See*—
Allardyce, Gordon E.; Amedee, Roy; and Belleau, Claude, 3,891,784.

Bellin, Jack L. S.: *See*—
Cusick, John H.; Brown, Alvin E.; Hamamoto, Al S.; and Bellin, Jack L. S., 3,890,831.

Belling & Lee Limited: *See*—
Blight, Dennis Jack; Miller, David Frederick; and Morgan, John Trevor, 3,891,292.

Belmonte, Jean-Claude: *See*—
Nougaret, Marcel; and Belmonte, Jean-Claude, 3,891,931.

Belmuth, Harold; and Leto, Alfred R. Apparatus for molding a brassiere cup shape. 3,891,378, Cl. 425-398.000.

Beloit Corporation: *See*—
Daane, Robert A.; and Han, Shu Tang, 3,891,497.
Justus, Edgar J., 3,891,157.

Bender, Hans: *See*—
Wolz, Werner; Bender, Hans; and Schmitt, Manfred, 3,890,992.

Bendix Corporation, The: *See*—
Anderson, Bruce W., 3,891,066.

Benedict, Lee: *See*—
Leo, Jack D.; and Benedict, Lee, 3,891,239.

Beneking, Heinz, to Licentia-Patent-Verwaltungs-G.m.b.H. Semiconductor arrangement for the detection of light beams or other suitable electro-magnetic radiation. 3,891,993, Cl. 357-19.000.

Bennett, David B.; and Harman, Charles P., to Honeywell, Inc. Variable frequency pulse train generator. 3,891,939, Cl. 331-1.00A.

Bennett, John P.; Bliss, George D.; and New, Michael, to Syntex (U.S.A.) Inc. Aquarium filter with replaceable cartridge. 3,891,555, Cl. 210-169.000.

Benninger, Siegfried; and Rebsdat, Siegfried, to Hoechst Aktiengesellschaft. Tertiary perfluoro-amino ethers. 3,891,625, Cl. 260-239.00A.

Bentz, Francis: *See*—
Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 3,891,718.

Berkhout, Frans: *See*—
Boonstra, Douwe Johannes; and Berkhout, Frans, 3,891,624.

Berlin, Alfred Anisimovich; Liogonky, Boris Izrailevich; and Zapadinsky, Boris Isaakovich. Method of producing dianhydrides of aromatic tetracarboxylic acids. 3,891,633, Cl. 260-240.00G.

Berman, Herbert M.; and Hooper, Ira, to Composite Construction Systems, Inc. Construction system. 3,890,750, Cl. 52-127.000.

Berman, Morton, to Avalon Industries, Inc. Hobby casting mold. 3,891,179, Cl. 249-134.000.

Bernd, Hubert: *See*—
Bartholomaus, Reiner; Bernd, Hubert; and Liedhegener, Friedel, 3,891,145.

Bernt, Erich: *See*—
Stary, Emil; Roeschlau, Peter; and Bernt, Erich, 3,891,573.

Berry, Ronald: *See*—
Lyman, Merton C., Jr.; and Berry, Ronald, 3,891,010.

Berthagen, Nils Ture Lennart. Frictionally adjustable hinge assembly with nonrotatable hinge pin bedring sleeve. 3,890,672, Cl. 16-141.000.

Besel, Roland Leroy: *See*—
Shearon, Michael Hillas; and Besel, Roland Leroy, 3,891,158.

Bestenreiner, Friedrich: *See*—
Deml, Reinhold; Greis, Ulrich; Bestenreiner, Friedrich; and Helmberger, Josef, 3,891,975.

Betts, Clifton R. Antitheft alarm system for automobiles. 3,891,967, Cl. 340-63.000.

Betts, Peter Alan; and Stephenson, Kenneth. Method of maintaining a column of liquid within an open-ended tube, and a tube device for carrying out the method. 3,891,392, Cl. 23-230.00R.

Betzler, Mark H.: *See*—
Mills, Justin W., Jr.; and Betzler, Mark H., 3,891,195.

Bible, Kenneth G. Furniture upholstery spring securing bracket. 3,891,198, Cl. 267-110.000.

Bichsel, Heinz F.; Furrer, Peter; and Maier, Jorg, to Swiss Aluminium Ltd. Induction-type reaction rails for high speed trains. 3,891,433, Cl. 75-147.000.

Birchall, James Derek, to Imperial Chemical Industries Limited. Friction material. 3,891,595, Cl. 260-38.000.

Bird, Paul G.: *See—*
Nishio, Kazuo; and Bird, Paul G., 3,891,568.

Bison-werke Bahre and Greten GmbH and Co. KG: *See—*
Gersbeck, Rolf; Greten, Berndt; and Steininger, Hans-Peter, 3,891,376.

Black, James Whyte; and Durant, Graham John, to SmithKline & French Laboratories Ltd. Method of inhibiting histamine activity with amidine derivatives. 3,891,764, Cl. 424-273.000.

Blackburn, Donald. Automatic fluid dispensing system. 3,891,123, Cl. 222-64.000.

Blackburn, Jack. Methods of producing grass carpets. 3,890,739, Cl. 47-56.000.

Blackburn, James R. Fairing for attachment to the handlebars of a bicycle. 3,891,265, Cl. 296-78.100.

Blaise, Rolland Robert, to Societe Anonyme pour l'Industrie Chimique. Compounds derived from tetrahydro-isoquinoline and gamma-benzopyrone. 3,891,651, Cl. 260-287.00R.

Blankenship, Ernest Bayne, to Research Products/Incinolet Corporation. Incinerator toilet having a vertically movable incinerator chamber lid. 3,890,653, Cl. 4-131.000.

Blankenship, Ernest Bayne, to Research Products/Incinolet Corporation. Incinerator toilet vented by air ejector. 3,890,654, Cl. 4-131.000.

Blau K. G. Fabrik Fuer Kraftfahrzeugteile: *See—*
Gerdes, Theo, 3,891,114.

Blazek, George A., to Advance Value Installations Inc. Pipeline apparatus. 3,891,146, Cl. 138-94.300.

Blight, Dennis Jack; Miller, David Frederick; and Morgan, John Trevor, to Belling & Lee Limited. Electrical component. 3,891,292, Cl. 339-36.000.

Bliss, George D.: *See—*
Bennett, John P.; Bliss, George D.; and New, Michael, 3,891,555.

Block, Michael J.; and Young, Donald C., to Union Oil Company of California. Free-flowing sulfur product. 3,891,743, Cl. 423-267.000.

Bloom Engineering Company, Inc.: *See—*
Hovis, James E.; Johns, James E.; and Finke, Harry P., 3,891,384.

Blount, Bobby J. Vehicle loading and storage system for wheeled containers. 3,891,102, Cl. 214-75.00T.

Bloxwich Lock and Stamping Company Limited, The: *See—*
Lycett, Peter; and Kempson, Kenneth William, 3,891,112.

Bobier, Wilfred S. Fluid device having plastic housing and means for mounting a cylinder barrel. 3,890,882, Cl. 91-487.000.

Bochumer Eisenhutte Heintzmann & Co.: *See—*
Spies, Kalus, 3,891,275.

Bock, Ronald E.: *See—*
Farfaglia, Silvio T.; Coburn, Leslie O.; Halpin, Robert G.; and Bock, Ronald E., 3,890,765.

Bockelmann, Paul; and Aschermann, Wilfried, to U.S. Philips Corporation. Circuit arrangement for electronic gain/control, in particular electronic volume control circuit. 3,891,937, Cl. 330-29.000.

Bodor, Nicolae S.; and Kaminski, James J., to INTERx Research Corporation. 1,4-Dichloro-2,2,5,5-tetrasubstituted-3,6-piperazinediones. 3,891,649, Cl. 260-268.0DK.

Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., to Interx Research Corporation. Novel, transient pro-drug forms of l-dopa. 3,891,696, Cl. 260-479.00R.

Boehm, Edward. Haying feeder. 3,890,933, Cl. 119-60.000.

Boehringer Mannheim GmbH: *See—*
Stary, Emil; Roeschlau, Peter; and Bernt, Erich, 3,891,573.

Boger, Leon H. Toothbrush. 3,891,085, Cl. 206-229.000.

Bohringer, Walter, to RCA Corporation. Start-up control circuit for SCR deflection. 3,891,892, Cl. 315-411.000.

Bolin, Robert A.: *See—*
Hirvela, Robert J.; and Bolin, Robert A., 3,891,971.

Bolkow Gesellschaft mit beschrankter Haftung: *See—*
Hermann, Joachim, 3,891,161.

Bollen, Romain Henri; and Van Esch, Robert Florent, to Agfa-Gevaert, N.V. Neutron detection and radiography. 3,891,852, Cl. 250-391.000.

Bolli, Hans. P.ving stone unit having integral connecting webs. 3,891,340, Cl. .04-38.000.

Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, to Schloemann-Siemag Aktiengesellschaft; and Concast AG. Apparatus for withdrawing a casting and feeding a dummy bar in a continuous casting machine for steel. 3,891,025, Cl. 164-154.000.

Bolto, Brian Alfred: *See—*
Battaerd, Hendrik Adrian Jacobus; Bolto, Brian Alfred; and Shah, Pir Ghulam Samadani, 3,891,576.

Bolton, Frank Edmund, to Banbury Buildings Holdings Limited. Securing glazing rails together. 3,890,752, Cl. 52-495.000.

Bonne, Ulrich, to Honeywell, Inc. Reflective alterable state material display. 3,891,309, Cl. 350-160.00R.

Bonneau, Marc: *See—*
Pilet, Charles; and Bonneau, Marc, 3,891,751.

Bontempi, Ignatius; and Giemisch, Peter, to De Francisci Machine Corporation. Pre-mixer for alimentary paste. 3,891,192, Cl. 259-110.000.

Booe, James M.; and Landry, Lawrence A., to P. R. Mallory & Co. Inc. Capacitors with sprayed electrode terminals. 3,891,901, Cl. 317-258.000.

Boone, George R. Fluid flow measuring system using improved temperature compensation apparatus and method. 3,891,391, Cl. 73-204.000.

Boonstra, Douwe Johannes; and Berkhout, Frans, to Scholten-Honig Research N.V. Preparation of redispersible hydrophobic starch derivatives. 3,891,624, Cl. 260-233.30R.

Boots, Vernie A., to A. Duda & Sons, Inc. Device for aligning, cutting and covering seed cane. 3,890,909, Cl. 111-1.000

Borden, Inc.: *See—*
Snow, Harold F., 3,890,676.

Bordner, Dalton W.; and Kline, Harlan H., to Ameron, Inc. Pressure cure method of making resin pipe. 3,891,489, Cl. 156-171.000.

Borg-Warner Corporation: *See—*
Silberschlag, Russell E., 3,890,884.
Tuzson, John J., 3,891,071.
Zimmer, George A; Allaben, Charles M., Jr.; and Weidman, William K., 3,891,286.

Borsotti, Giampietro: *See—*
Ribaldone, Giuseppe; and Borsotti, Giampietro, 3,891,650.

Boscacci, William L.: *See—*
Lucasey, Joseph A.; and Boscacci, William L., 3,891,063.

Bosch, Paul, to Robert Bosch G.m.b.H. Regulating system for pumps. 3,891,354, Cl. 417-216.000.

Bosch, Paul: *See—*
Rometsch, Werner; Robeller, Walter; Lutz, Gerhard; Reichel, Eckehart; Bosch, Paul; and Vohringer, Gerd, 3,890,883.

Botnick, Irlin H. Shutoff valve with cleanout filter. 3,891,001, Cl. 137-549.000.

Bouchard, Michel. Anchoring device for securing and positioning equipment. 3,890,758, Cl. 52-713.000.

Bouclet, Roland: *See—*
Haurat, Edouard; and Bouclet, Roland, 3,890,723.

Bourgeois, Norbert Paul, to Etudes et Bonneterie S.A. Needle selection device for a circular knitting machine. 3,890,805, Cl. 66-50.00R.

Bouy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, to Rhone-Progil. Electrolytic diaphragm cells including current connection means between the cell base and anode. 3,891,531, Cl. 204-263.000.

Bowser, George C.; Moser, James R., deceased; and Moser, Patricia Karen, administratrix, to Catalyst Research Corporation. Thermal battery and molten metal anode therefore. 3,891,460, Cl. 136-83.00T.

Boyer, Robert Allan, to Ralston Purina Company. Method of making protein food products resembling cheese. 3,891,777, Cl. 426-573.000.

Boyer, Robert Allan, to Ralston Purina Company. Method of making protein food products resembling cheese. 3,891,778, Cl. 426-573.000.

Bozhko, Viktor Vasilievich: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.

BP Chemicals (U.K.) Limited: *See—*
Hawkins, Edwin George Edward, 3,891,663.

Brady, Robert T.: *See—*
McInerney, Michael J.; Brady, Robert T.; and Phillips, Alvia E., 3,890,936.

Brady, Stephen F.: *See—*
Veber, Daniel F.; and Brady, Stephen F., 3,891,692.

Braga, Albert T.; Brenner, Robert A.; and Odle, Ralph S., Jr., to Whirlpool Corporation. Broken belt power-disconnect system for dryers. 3,890,719, Cl. 34-55.000.

Braga, Alfred M.: *See—*
Surrette, Richard H.; and Braga, Alfred M., 3,891,092.

Brandenstein, Manfred: *See—*
Ernst, Horst; Brandenstein, Manfred; and Olschewski, Armin, 3,891,284.

Brandt, Hans-Werner: *See—*
Glaser, Hans-Joachim; and Brandt, Hans-Werner, 3,891,536.

Braun, Gerald W. Control arrangement for a hydraulically powered vehicle. 3,891,042, Cl. 180-6.480.

Braun, Otto P.: *See—*
Braun, Otto Paul; and Oehler, Horst, 3,891,979.

Braun, Otto Paul; and Oehler, Horst, to Braun, Otto P. Road condition monitoring devices. 3,891,979, Cl. 340-234.000.

Brautigam, Hans; Weidenbach, Gunter; and Koepernik, Karl Hermann, to Kali-Chemie Aktiengesellschaft. Catalyst for purifying exhaust gases. 3,891,575, Cl. 252-455.00R.

Braxton, Henry G., Jr.; and Lehikoinen, U. Albert, to Ethyl Corporation. Modified phosphazene flame retardant. 3,891,448, Cl. 106-15.0FP.

Braxton, Henry G., Jr.; Griffing, Margaret E.; and Jolly, James G., to Ethyl Corporation. Modified phosphazene fire retardants. 3,891,449, Cl. 106-15.0FP.

Braytenbah, Andrew S., to Westinghouse Electric Corporation. Steam turbine system with digital computer position control having improved automatic-manual interaction. 3,891,344, Cl. 415-1.000.

Brennan, Edward N. Golf tee carrying and dispensing device. 3,891,130, Cl. 224-5.00C.

Brennan, John W.: *See—*
Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., 3,890,911.

Brenner, Robert A.: *See—*
Braga, Albert T.; Brenner, Robert A.; and Odle, Ralph S., Jr., 3,890,719.

Breuer, Charles Benedict, to American Cyanamid Company. Organ function test cards. 3,891,507, Cl. 195-103.50R.

Bricker, Francis G.; Isaacs, Jack L.; and Nobbs, Douglas C., to General Electric Company. Shipping skid. 3,891,170, Cl. 248-119.000.

Bridgeman, Cecil K., to Picker X-Ray Mfg. Limited. X-ray table. 3,891,850, Cl. 250-444.000.

Bridgeport Metal Goods Manufacturing Company, The: *See—*
Vasas, Martin M., 3,891,330.

Bries Engineering Ltd.: *See—*
Cadle, Terence M., 3,891,399.

Bristol-Myers Company: *See—*
Monkovic, Ivo; Saucier, Michel; and Montzka, Thomas Alfred, 3,891,657.

British Gas Corporation: *See—*
Templeman, John Joseph, 3,891,353.

Britsch, Helmut, to BBC Brown Boveri & Company. High voltage winding with protection against glow discharge. 3,891,880, Cl. 310-196.000.

Brixy, Heinz, to Kernforschungsanlage Julich GmbH. Thermal noise measurement system. 3,890,841, Cl. 73-359.000.

Broad, Michael John: *See—*
Moss, Norman; Martin, Barrie James; and Broad, Michael John, 3,890,935.

Broaddus, Charles David; and Robbins, Medford Dwight, to Procter & Gamble Company. Process for preparing r-sultones. 3,891,672, Cl. 260-327.00S.

Broadfoot, John T. Method of replacing piling. 3,890,794, Cl. 61-54.000.

Brodie, Alexander O.: *See—*
Richardson, John L.; Brodie, Alexander O.; and Lewis, Clarke H., 3,891,556.

Broken Hill Proprietary Company Limited, The: *See—*
Roper, Howard Frank, 3,891,079.

Brokke, Mervin E., to Stauffer Chemical Company. N-(3,4,4-trifluorobutene-3)thiazalodine dione. 3,891,662, Cl. 260-306.70R.

Brooking, Ivor Harold: *See—*
Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, 3,891,346.

Brooks, Joseph J.: *See—*
Sievers, Robert E.; and Brooks, Joseph J., 3,891,413.

Brotz, William C., to Rowe International, Inc. Ten button selection system for automatic phonograph. 3,891,970, Cl. 340-162.000.

Brown, Alvin E.: *See—*
Cusick, John H.; Brown, Alvin E.; Hamamoto, Al S.; and Bellin, Jack L. S., 3,890,831.

Brown, Harold. Hydronic heating system. 3,891,817, Cl. 219-10.55R.

Brown, Melancthon S., deceased; and by Kohn, Gustave K., special administrator, to Chevron Research Company. Herbicidal 1-carbonamidothio-3-aryl ureas. 3,891,424, Cl. 71-98.000.

Brown, Robert S.; and Muzzy, Raymond J., to United States of America, Army. Propellant instability modifier. 3,891,482, Cl. 149-7.000.

Brown, Samuel L.: *See—*
Travor, Bruce W.; and Brown, Samuel L., 3,890,902.

Brown, Ted R. Air conditioning process. 3,890,797, Cl. 62-91.000.

Bruel, Alain. Grape-gathering machine. 3,890,774, Cl. 56-330.000.

Bruel, Alain. Beating device for a grape-gathering machine. 3,890,775, Cl. 56-330.000.

Bruget, Bernard C. Pipe smokers' folding combination tool. 3,890,982, Cl. 131-243.000.

Brugge, Walter James; and Takacs, Edward Francis, to Addressograph-Multigraph Corporation. Card gage for data recorder. 3,890,899, Cl. 101-269.000.

Brunel, John R. Folding carrier rack for pick-up trucks. 3,891,262, Cl. 296-3.000.

Brunswick Corporation: *See—*
Harris, Mark, 3,891,917.
Minks, Floyd M., 3,890,948.

Bryant, Greyham Frank: *See—*
Beeston, John Wilmot; Bryant, Greyham Frank; and Spooner, Peter David, 3,890,817.

Buckler, Benjamin: *See—*
Samuelian, Maurice P.; and Buckler, Benjamin, 3,891,171.

Budreau, Alan J.: *See—*
Carr, Paul H.; and Budreau, Alan J., 3,891,929.

Buehler Ltd.: *See—*
Keith, Marvin W., Jr., 3,891,409.

Buelk, Eggert, to Rockwell International Corporation. Controls for aquatic towing craft. 3,890,920, Cl. 115-6.100.

Buildex Incorporated: *See—*
Loikitz, Frank, 3,891,334.

Bunzl and Biach Aktiengesellschaft: *See—*
Angruner, Herbert, 3,890,910.

Burckhardt, Manfred H., to Daimler-Benz Aktiengesellschaft. Installation for filling several pressure reservoirs, especially in motor vehicles. 3,890,996, Cl. 137-119.000.

Burdick, Robert E., to Rolair Systems, Inc. Air bearing transporter having multidirectional drive unit. 3,891,048, Cl. 180-119.000.

Burger, Hans; and Riester, Hans, to Georg Fischer Aktiengesellschaft. Gas filter. 3,891,418, Cl. 55-302.000.

Burgess, Glen W., to Clark Equipment Company. Straddle carrier lifting means. 3,891,107, Cl. 214-392.000.

Burlington Industries, Inc.: *See—*
Reid, James P., Jr.; and McConnell, Bobby L., 3,891,386.

Burmah Oil Trading Limited: *See—*
Field, Peter G. S.; and Lock, David A., 3,891,711.

Burns, William F. Adjustable dental impression tray. 3,890,711, Cl. 32-17.000.

Burris Industries, Incorporated: *See—*
Taylor, William P., 3,891,267.

Burroughs Corporation: *See—*
Ehlers, Randall G., 3,891,839.
Lee, James Y., 3,891,983.

Burton, Henry A. Dog ladder for boats. 3,891,053, Cl. 182-97.000.

Burwick, Edward R., to Armco Steel Corporation. Method of electroplating utilizing zinc dross anodes. 3,891,518, Cl. 204-35.00R.

Buske, Earl R. Tow truck boom and method of constructing same. 3,890,696, Cl. 228-173.000.

Busse, Louis W.: *See—*
Warren, Don R.; and Busse, Louis W., 3,891,509.

Buynak, Robert G.: *See—*
Johnson, Waldo O.; and Buynak, Robert G., 3,890,741.

Byron Jackson Inc.: *See—*
Scott, Lyle B., 3,891,033.

Bysouth, Raymond: *See—*
Robertson, Peter Struan; and Bysouth, Raymond, 3,891,783.

C.G.E.E.-Alsthom: *See—*
Debaigt, Jean, 3,891,295.

C. J. Doris: *See—*
Lamy, Jacques Edouard, 3,890,790.

C. L. Frost & Son, Inc.: *See—*
Frost, Charles C., 3,890,773.

Cadle, Terence M., to Bries Engineering Ltd. Sintered glass containing ferrous material. 3,891,399, Cl. 29-182.500.

Caffrey, Richard Francis: *See—*
Aspelin, Gary Bertil; Caffrey, Richard Francis; and Lauer, William, 3,890,966.

Cahn, Jean: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,891,765.
Plat, Michel Marie Rene; Plat, Monique, nee Berry; Cahn, Jean; and Tisseyre, Pierre Georges Christian, 3,891,640.

Calcagno, Kenneth H., to Olin Corporation. Constant depth cutter assembly. 3,891,015, Cl. 144-136.00J.

Calderon, Nissim: *See—*
Scott, Kenneth W.; and Calderon, Nissim, 3,891,816.

Cale, Albert Duncan, Jr.: *See—*
Lunsford, Carl Dalton; and Cale, Albert Duncan, Jr., 3,891,646.

Calgon Corporation: *See—*
Woodrum, Guy Thomas; and Barnett, Richard E., 3,891,708.

Califano, Frank L.; Stepien, George, Jr.; and Russell, Thomas E., to Flintkote Company, The. Product and method for reducing water ions through soil by seepage. 3,891,586, Cl. 260-28.5AS.

California Institute of Technology: *See—*
Chang, Daniel P. Y.; Friedlander, Sheldon K.; and California Institute of Technology, 3,891,547.

Camco, Incorporated: *See—*
Tausch, Gilbert H.; and Pringle, Ronald E., 3,891,032.

Cameron, Donald Dean: *See—*
Wolfe, Paul Dillon; Saxton, Ronald Luther; and Cameron, Donald Dean, 3,891,609.

Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine. Implosion jack. 3,890,824, Cl. 72-453.000.

Campbell, Laurie Jay: *See—*
Auer, Robert Thomas; Campbell, Laurie Jay; Lohr, Raymond J.; and Smith, James, 3,891,234.

Camph, Sven Erik. Automatic slack adjuster. 3,891,068, Cl. 188-196.0BA.

Campot, Etienne: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.

Canadian Patents & Development Limited: *See—*
Gregerson, Leslie F.; and Symonds, Gordon R., 3,890,718.
Shen, Kuo-Cheng, 3,891,738.

Cannon, Clifford D.: *See—*
Nadsady, Clarence A.; and Cannon, Clifford D., 3,891,291.

Cannuli, Vincent Michael: *See—*
Ladany, Ivan; and Cannuli, Vincent Michael, 3,891,478.

Canon Kabushiki Kaisha: *See—*
Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.
Ito, Yoshio, 3,891,846.
Katayama, Hajime; Miyamoto, Koichi; and Ohashi, Shoji, 3,890,721.

Capt, Edmond; and Gander, Gerald, to Valjoux S.A. Chronograph watch. 3,890,779, Cl. 58-76.000.

Caputo, Arnold P.; Anthony, David W.; and Pickett, William H., to Plasticrete Corporation. Post hole block. 3,890,751, Cl. 52-166.000.

Carley, Don A.; and Crookshank, Fred T., to Texaco Inc. Process for preparing mixed lithium-calcium soap thickened greases. 3,891,564, Cl. 252-40.000.

Carlin, William W., to PPG Industries, Inc. Opening of molybdenite ores and the electrowinning of rhenium. 3,891,521, Cl. 204-105.00R.

Carlin, William W.; Darlington, William B.; and Dubois, Donald W., to PPG Industries, Inc. Recovery of fission products from acidic waste solutions thereof. 3,891,741, Cl. 423-2.000.

Carlsen, W. John, to GTE Laboratories Incorporated. Hologram memory with sequential data storage and beam angular relationship. 3,891,976, Cl. 340-173.0LM.

Carlson, Richard D.: *See—*
Marciniak, Harry W.; Carlson, Richard D.; and Dever, James L., 3,891,599.
Maul, James J.; and Carlson, Richard D., 3,891,600.

Carlsson, Per Arvid Emil; and Corrodi, Hans Rudolf, to Aktiebolaget Hassle. Treatment of Parkinson's disease. 3,891,768, Cl. 424-309.000.

Carmel, Amichai Meir; and Lundh, Bengt Olov, to Rederiaktiebolaget Nordstjernan. Method and an apparatus for dewatering a suspension. 3,891,549, Cl. 210-66.000.

Carpenter, Roland Paul; Cowie, William Pirie; Heyes, Alan; and Sutton, Anthony Hubert, to Lever Brothers Company. Protein product. 3,891,776, Cl. 426-573.000.

Carr, Paul H.; and Budreau, Alan J., to United States of America, Air Force. Acoustic surface wave frequency synthesizer. 3,891,929, Cl. 328-14.000.

Carrigan, James David, to Vance Industries, Inc. Flame hardener. 3,891,194, Cl. 266-4.00A.

Caspers, Hubert H.: *See—*
Rast, Howard E.; and Caspers, Hubert H., 3,891,559.

Castanedo, Edwin W. Tongue cleaning and massage instrument. 3,890,964, Cl. 128-62.00R.

Castro, Rodolfo: *See—*
Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, 3,890,865.

Catalyst Research Corporation: *See—*
Bowser, George C.; Moser, James R., deceased; and Moser, Patricia Karen, administratrix, 3,891,460.

Cater, Thomas F.: *See—*
Rodgers, Daniel L.; and Cater, Thomas F., 3,891,832.

Caterpillar Tractor Company: *See—*
Girard, William T.; Hamilton, Thomas R.; and Waddell, Bennett N., 3,890,726.
Habiger, Cyril W., 3,890,788.

Catt, John D.; and Matier, William L., to Mead Johnson & Company. Sulfamide process. 3,891,703, Cl. 260-556.00N.

Caubet, Jacques-Jean, to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement. Surface coating for ferrous alloy parts. 3,890,686, Cl. 29-196.100.

Cawrse, Richard S. Apparatus for applying lids to containers. 3,890,767, Cl. 53-296.000.

Cefilac: *See—*
de Charsonville, Jacques, 3,890,818.

Celto, John E.: *See—*
Schimitschek, Erhard J.; Trias, John A.; and Celto, John E., 3,891,569.

Cenker, Moses; and Narayan, Thirumurti L., to BASF Wyandotte Corporation. Process for the preparation of isocyanurate foams employing halogenated aliphatic alkanol accelerators. 3,891,579, Cl. 260-2.5AW.

Cenker, Moses: *See—*
Kan, Peter T.; and Cenker, Moses, 3,891,578.

Centre National d'Etudes Spatiales: *See—*
Thomin, Georges, 3,891,953.

Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement: *See—*
Caubet, Jacques-Jean, 3,890,686.

Centre Stephanois de Recherches Mechaniques Hydromecanique et Frottement: *See—*
Grellet, Bernard, 3,891,519.

Centro Sperimentale Metallurgico S.p.A.: *See—*
Cola, Giorgio, 3,891,022.
DeLuca, Bruno, 3,890,819.

Century Industries, Inc.: *See—*
Perry, L. F., Jr., 3,891,193.

Cerroni, Manlio. System for recovering and treating useful elements from waste materials. 3,891,105, Cl. 214-305.000.

Ceskoslovenska akademie Ved No. 3 Narodni: *See—*
Vodnansky, Jiri; and Stoy, Artur, 3,890,683.

Chambers, John Philip: *See—*
Phillips, Geoffrey John; and Chambers, John Philip, 3,891,994.

Chancellor Chair Company: *See—*
Griffin, Vernon Dale, 3,891,259.

Chandler, Roy L., to Red Ant Products, Inc. Apparatus for transporting a bicycle on a vehicle. 3,891,132, Cl. 224-42.03B.

Chang, Daniel P. Y.; Friedlander, Sheldon K.; and California Institute of Technology. Permeable hollow fiber filter. 3,891,547, Cl. 210-23.000.

Chang, David Chi-kung; and McDowell, Maurice James, to du Pont de Nemours, E. I., and Company. Coating compositions. 3,891,591, Cl. 260-29.6WB.

Chao, Kwei C.: *See—*
Ridgway, John A., Jr.; and Chao, Kwei C., 3,891,772.

Charbonnages de France: *See—*
Chauvin, Raymond, 3,891,734.

Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, to International Standard Electric Corporation. Electronic switching module. 3,891,807, Cl. 179-15.0BS.

Chatelon, Andre Edouard Joseph; and Coudray, Andre Lucien, to International Standard Electric Corporation. System for preventing intelligible crosstalk in TDM switching systems. 3,891,806, Cl. 179-15.0AN.

Chauvel, Bernard; and Daniel, Jean-Claude, to Rhone-Progil. Process for producing rubber polymer latices with large particles. 3,891,592, Cl. 260-29.70E.

Chauvin, Raymond, to Charbonnages de France; and Houilleres du Bassin du Nord et du Pasde-Calais. Process for the manufacture of light granulates. 3,891,734, Cl. 264-43.000.

Cheek, Thomas B.; Thornhill, Daniel E.; and Stewart, Ronald B., to Adage, Inc. Computer display terminal. 3,891,982, Cl. 340-324.0AD.

Chemische Fabrik Kalk GmbH: *See—*
Jenkner, Herbert, 3,891,700.

Chernyavsky, Vladimir Pavlovich: *See—*
Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; Kadi-Ogly, Ibragim Akhmedovich; and Tjurin, Jury Grigorievich, 3,891,877.

Chester, Arthur N., to Hughes Aircraft Company. Large screen color display. 3,891,560, Cl. 250-461.000.

Chevron Research Company: *See—*
Brown, Melancthon S., deceased; and Kohn, Gustave K., special administrator, 3,891,424.
Katsumoto, Kiyoshi; and Lind, Wilton H., 3,891,680.
Walkey, John E., 3,891,538.

Chiba, Akio: *See—*
Tomita, Sadami; Chiba, Akio; and Miyajima, Goh, 3,891,475.

Chikatsu, Yoshishige: *See—*
Yaeda, Yasuyuki; Chikatsu, Yoshishige; Ando, Noriaki; and Sakata, Ryuichi, 3,891,724.

Chilman, John Alfred: *See—*
Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, 3,891,346.

Chollet, Pierre: *See—*
Gervais, Edouard; Levert, Henri; and Chollet, Pierre, 3,891,024.

Choules, Marcel Henry; and Hare, Alan William, to Russell Finex Limited. Vibratory apparatus. 3,891,191, Cl. 259-1.00R.

Christ, Frederick C., to Armco Steel Corporation. Fluid guide plunger system. 3,891,356, Cl. 417-437.000.

Christensen, Bruce A., to Sperry Rand Corporation. Syndrome logic checker for an error correcting code decoder. 3,891,969, Cl. 340-146.1AL.

Christoff, Chris A., to Stevens Corporation. Offset rotary printing press with cable actuated form rollers. 3,890,897, Cl. 101-148.000.

Chrysler Corporation: *See—*
Allardyce, Gordon E.; Amedee, Roy; and Belleau, Claude, 3,891,784.
Latva, Henry F., 3,891,473.
May, Robert F., 3,891,166.

Chu, Simon L., to Polychrome Corporation. Process of electrolyically anodizing a mechanically grained aluminum base and article made thereby. 3,891,516, Cl. 204-33.000.

Ciba-Geigy AG: *See—*
De Montmollin, Rene; and Riat, Henri, 3,891,618.

Ciba-Geigy Corporation: *See—*
Drabek, Jozef; and Varsanyi, Denis, 3,891,728.
Hari, Stefan; and Ronco, Karl, 3,891,685.
Langley, Robert; and Barraclough, Ronald, 3,891,455.
Stephen, John F., 3,891,673.

Citizen Watch Company Limited: *See—*
Barozzi, Gian Piero; and Horeschi, Giancarlo, 3,891,142.
Nihira, Shohachi, 3,890,894.
Urushida, Yoshihisa, 3,890,776.

Civarella, Alfredo: *See—*
Stroezel, Reinhold; Hettich, Alfred; and Civarella, Alfredo, 3,891,049.

Clark Equipment Company: *See—*
Burgess, Glen W., 3,891,107.
Duttarer, Ralph M.; and Hushower, Richard R., 3,891,003.

Clark, James O., to Westinghouse Electric Corporation. Elevator system. 3,891,064, Cl. 187-29.00R.

Clark, Lowell E., to Motorola, Inc. Field shaping layer for high voltage semiconductors. 3,890,698, Cl. 29-577.000.

Clark, Michael A. Animal commode. 3,890,930, Cl. 119-1.000.

Clark, Thomas F., to Allis-Chalmers Corporation. Compact unit breaker. 3,891,862, Cl. 307-125.000.

Clason, Jan Christiaan, to Hazemeijer B.V. Vacuum circuit interrupter. 3,891,896, Cl. 317-58.000.

Clavin, Edward A., to CRC-Crose International, Inc. Apparatus for driving a device within a pipe. 3,890,905, Cl. 104-138.00G.

Clerc, Michel; and Goujon, Paul, to Commissariata l'Energie Atomique. Method of pumping for a laser and device for carrying out said method. 3,891,942, Cl. 331-94.50G.

Clinical Convenience Products, Inc.: *See—*
Warren, Don R.; and Busse, Louis W., 3,891,509.

Cloke, Robert L., to Information Storage Systems, Inc. Low leakage current integrator. 3,891,840, Cl. 235-183.000.

Clontz, James G. Control assembly for rear view mirror. 3,890,848, Cl. 74-501.00M.

Clugage, Robert G. Compression hold-down elements. 3,891,201, Cl. 269-136.000.

CMI Corporation: *See—*
Allen, Thomas E.; and Smith, Don W., 3,890,783.

Coats & Clark, Inc.: *See—*
Einhorn, Ruediger, 3,891,172.

Coats Company, Inc., The: *See—*
Holladay, Jimmie L., 3,891,019.

Coburn, Leslie O.: *See—*
Farfaglia, Silvio T.; Coburn, Leslie O.; Halpin, Robert G.; and Bock, Ronald E., 3,890,765.

Codrino, Giuseppe. Device for continuously regulating the intensity of the luminous flow projected towards the radiant energy carriers. 3,891,841, Cl. 240-1.0LP.

Coirre, Bertrand: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,891,765.

Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, to Franco Chimie S.a.r.l. Anti-inflammatory and analgesic L-hydroxyproline derivatives. 3,891,765, Cl. 424-274.000.

Cola, Giorgio, to Centro Sperimentale Metallurgico S.p.A. Process for manufacturing cores and moulds. 3,891,022, Cl. 164-41.000.

Cole, Ernest R., Jr.; Dressel, Waldemar M.; and Smith, Lawrence L., to United States of America, Interior. Recovery of lead. 3,891,430, Cl. 75-77.000.

Coleman, Bestor P.; and McConnell, Kennedy, to Interlake, Inc. Conveyor stop. 3,891,073, Cl. 193-35.00A.

Coles, Herbert George, Jr., to Data General Corporation. Code recognition apparatus. 3,891,831, Cl. 235-61.11E.

Colgate-Palmolive Company: *See—*
Fischer, Charles F., 3,891,365.
Renold, Adolph, 3,891,563.

Collon, Paul: *See—*
Bouy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, 3,891,531.

Colorado School of Mines Research Institute: *See—*
Handwerk, Glenn E., 3,891,744.

Colpoys, Patrick J., to Union Carbide Corporation. Gravel packing fluid. 3,891,565, Cl. 252-8.55R.

Cominco Ltd.: *See—*
McKay, Donald R.; and Swinkels, Godefridus M., 3,891,522.

Commercial Solvents Corporation: *See—*
Hodge, Edward B.; and Riddick, John A., 3,891,615.

Commissariata l'Energie Atomique: *See—*
Clerc, Michel; and Goujon, Paul, 3,891,942.

Commonwealth Scientific and Industrial Research Organization: *See—*
Battaerd, Hendrik Adrian Jacobus; Bolto, Brian Alfred; and Shah, Pir Ghulam Samadani, 3,891,576.

Compactor Company, Inc.: *See—*
Hennells, Ransom J., 3,890,890.

Compagnie Francaise des Petroles: *See—*
Delestrade, Andre; and Marce, Roger, 3,891,038.

Compagnie Generale d'Automatisme: *See—*
Delestrade, Andre; and Marce, Roger, 3,891,038.

Compagnie Generale d'Electricite: *See—*
Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, 3,891,944.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Deproux, Jacques Roland, 3,890,895.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
De Loye, Martin, 3,891,793.
Filaferro, Rene; and Hebert, Francois, 3,891,927.

Composite Construction Systems, Inc.: *See—*
Berman, Herbert M.; and Hooper, Ira, 3,890,750.

Con-Stan Industries, Inc.: *See—*
Nobbs, Mulford J., 3,890,978.

Concast AG: *See—*
Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, 3,891,025.

Condit, Paul, Jr. Oil and debris removal unit. 3,891,558, Cl. 210-526.000.

Conklin, Christine, to Herculite Protective Fabrics Corporation. Electrically conductive sheeting. 3,891,786, Cl. 428-136.000.

Conneau, Jean: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.

Conner, Charles C.; and Price, William R., to Price, William R. Method and apparatus for sensing and controlling motion of a movable member. 3,891,932, Cl. 328-147.000.

Connors, John D.: *See—*
Moore, William C.; Connors, John D.; and Newman, Richard W., 3,890,961.

Consolidated Devices, Inc.: *See—*
Grabovac, Bosko; and Vuceta, Ivan N., 3,890,859.

Continental Can Company, Inc.: *See—*
Szatkowski, Richard R., 3,891,135.

Continental Display Corporation: *See—*
Feil, Fred W., 3,891,335.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Sievers, Willi; and Van Steenput, Andre, 3,891,363.

Contival, Serge: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.

Contraves AG: *See—*
Heller, Rudolf, 3,891,301.

Cook, William J.; and Ellens, Gordon A., to U.S. Industries, Inc. Housing for combination lap and shoulder belts. 3,891,274, Cl. 297-389.000.

Cooper, Carlos M.; and Gladson, Francis M., Jr. Self container toilet and sewage treatment unit. 3,891,554, Cl. 210-152.000.

Cooper, Julius; and Reinertsen, Tormod K., to Ideal Toy Corporation. Skee-ball apparatus including ball ejection targets. 3,891,213, Cl. 273-95.00D.

Copas, Donald D. Holding frame for cable splicing tools and method for splicing cables. 3,890,689, Cl. 29-203.00C.

Cope, Geoffrey Wilton, to Dresser Industries, Inc. Hand brake automatic release assembly. 3,891,277, Cl. 303-2.000.

Corbett, James Patrick. Rotating piezoelectric transducer mounting. 3,891,870, Cl. 310-8.700.

Corderac'k, Maurice Louis Paul Jean. Mounting assembly for bicycle saddle or the like. 3,891,333, Cl. 403-84.000.

Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, to Ford Motor Company. Electroplating system for improving plating distribution of elnisil coatings. 3,891,534, Cl. 204-272.000.

Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, to Ford Motor Company. Method for insuring high silicon carbide content in elnisil coatings. 3,891,542, Cl. 204-16.000.

Corrodi, Hans Rudolf: *See—*
Carlsson, Per Arvid Emil; and Corrodi, Hans Rudolf, 3,891,768.

Cothron, Lawson B., to Labann Corporation. Combination latch & dead bolt lock assembly. 3,890,813, Cl. 70-92.000.

Coudray, Andre Lucien: *See—*
Chatelon, Andre Edouard Joseph; and Coudray, Andre Lucien, 3,891,806.

Coulter, Brent W.; and Migdalek, Laurence F., to Honeywell Information Systems Inc. Data processing system having emulation capability for providing wait state simulation function. 3,891,974, Cl. 340-172.500.

Cowie, William Pirie: *See—*
Carpenter, Roland Paul; Cowie, William Pirie; Heyes, Alan; and Sutton, Anthony Hubert, 3,891,776.

Cox, Gordon L.; and Williams, Olin E., to Koppers Company, Inc. Method for selective decarburization of alloy steels. 3,891,429, Cl. 75-60.000.

Crancon, Jean-Pierre: *See—*
Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, 3,891,944.

CRC-Crose International, Inc.: *See—*
Clavin, Edward A., 3,890,905.

Cremonese, Henry V. Kitchen knife. 3,890,707, Cl. 30-340.000.

Creusot-Loire: *See—*
.Lhenry, Bernard, 3,890,862.

Crilly, Joseph B.: *See—*
Drisko, Richard W.; and Crilly, Joseph B., 3,891,583.

Crist, Elester M. Voltage amplitude controlled reversing D.C. power circuit. 3,891,906, Cl. 318-257.000.

Crook, James D.: *See—*
Miller, Laurence B.; and Crook, James D., 3,891,035.

Crook, Monty Frederick: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, 3,891,726.

Crookshank, Fred T.: *See—*
Carley, Don A.; and Crookshank, Fred T., 3,891,564.

Crossman, Philip Edgar; and Resch, Richard Jerome, to Krueger Metal Products, Inc. Pneumatic stool with foot rest connected to seat base. 3,891,270, Cl. 297-347.000.

Crowe, Curtis W., to Dow Chemical Company, The. Fluid loss additive. 3,891,566, Cl. 252-8.55R.

Crown Recreation, Inc.: *See—*
Scullin, Francis E., 3,891,214.

Crown Zellerbach Corporation: *See—*
Fowells, Robert W., 3,891,610.

Crown Zellerbach International, Inc.: *See—*
Kato, Teiji; and Okamoto, Katsumi, 3,891,499.

Crumley, J. A.: *See—*
Swengel, Robert Charles, Sr.; and Crumley, J. A., 3,891,789.

Cumberland Corporation: *See—*
Rhinehart, Vance E.; and Yother, Floyd G., 3,891,228.

Cunningham, Willis C.; George, Charles R.; and Shryock, Stanley H., to Halliburton Company. Composition and method for cementing wells in low temperature formations. 3,891,454, Cl. 106-89.000.

Curtiss-Wright Corporation: *See—*
Davis, Robert C.; and Pratt, Winthrop B., 3,891,357.
Jones, Charles, 3,891,059.

Cushman, Donald R.; and Schick, John W., to Mobil Oil Corporation. Modified natural gums. 3,891,620, Cl. 260-209.600.

Cusick, John H.; Brown, Alvin E.; Hamamoto, Al S.; and Bellin, Jack L. S., to United States of America, Navy. Ultrasonic bond monitor. 3,890,831, Cl. 73-88.00B.

Cylpik, Incorporated: *See—*
Van Schoyck, Quentin H., 3,890,827.

Daane, Robert A.; and Han, Shu Tang, to Beloit Corporation. Nonaqueous defiberizing process of waste paper in the presence of steam and a liquid nonmiscible in water, e.g., tetrachlorethylene. 3,891,497, Cl. 162-6.000.

Dabby, Franklin Winston; and Kestenbaum, Ami, to Western Electric Company, Inc. Method of filtering modes in optical waveguides. 3,891,302, Cl. 350-96.0WG.

Daguet, Jacques Lucien; Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, to Telecommunications Radioelectriques T.R.T. Single sideband system for digitally processing a given number of channel signals. 3,891,803, Cl. 179-15.0FS.

Dahl, Norman C. Two-part, two-material fastening element. 3,890,876, Cl. 85-62.000.

Dai-Nippon Suban Manufacturing Co. Ltd.: *See—*
Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, 3,891,503.
Daicel, Ltd.: *See—*
Higuchi, Masaru; and Ohnaka, Kouichi, 3,891,709.
Sawada, Hideo; and Kawamoto, Junji, 3,890,983.
Daimler-Benz Aktiengesellschaft: *See—*
Barenyi, Bela, 3,891,258.
Burckhardt, Manfred H., 3,890,996.
Flemming, Helmut, 3,891,232.
Lehmann, Adolf, 3,891,252.
Vogt, Ulrich, 3,891,287.
Wilfert, Karl; Barenyi, Bela; and Renner, Hermann, 3,891,266.
Dainippon Ink & Chemicals Inc.: *See—*
Hisamatsu, Hiroyoshi; Takahashi, Katutoshi; and Takase, Masanori, 3,891,523.
Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, 3,891,503.
Damon, Neil F., to Augat, Inc. Panel board mounting and interconnection system for electronic logic circuitry. 3,891,898, Cl. 317-101.0CC.
Damon, William H., to Allied Chemical Corporation. Inflator seal. 3,891,233, Cl. 280-150.0AB.
Dana Corporation: *See—*
Sink, William Howard; and Flotow, Richard Allen, 3,891,072.
Daniel, Jean-Claude: *See—*
Chauvel, Bernard; and Daniel, Jean-Claude, 3,891,592.
Danilenko, Valeria Mikhailovna: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.
Danneil, Axel; Flickinger, Erich; Graefje, Heinz; Plass, Reinhold; and Schnur, Rudolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of very pure butanediol. 3,891,511, Cl. 203-81.000.
Darlington, William B.: *See—*
Carlin, William W.; Darlington, William B.; and Dubois, Donald W., 3,891,741.
Data General Corporation: *See—*
Coles, Herbert George, Jr., 3,891,831.
Date, Tasuku; and Yagi, Shizuo, to Honda Giken Kogyo Kabushiki Kaisha. Reduction of NO_x, HC, and CO in the exhaust gases of internal combustion engines. 3,890,942, Cl. 123-75.00B.
Dave, Shashi Bhaishanker, to Johns-Manville Corporation. Trimethylolpropane use of macroreticular polymers of trimethacrylate for making chromatographic separations. 3,891,412, Cl. 55-67.000.
Davenport, Larry C.: *See—*
Ellison, Donald E.; and Davenport, Larry C., 3,891,137.
Davidson, Morris J.: *See—*
Nick, Charles F.; and Davidson, Morris J., 3,890,832.
Davies, John R., to Oliver Machinery Company. Method and apparatus for inspecting position of labels on product surfaces. 3,891,324, Cl. 356-156.000.
Davis, Alwyn K.; and St. John, Ward A. Sanitary diaper. 3,890,973, Cl. 128-286.000.
Davis, Bryan Terence: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, 3,891,726.
Davis, Dalton M., to E-T Industries, Inc. Spider machining apparatus. 3,891,343, Cl. 408-42.000.
Davis, Kenneth E., to Hobart Corporation. Analysis of comminuted meat products. 3,890,825, Cl. 73-15.00B.
Davis, Robert C.; and Pratt, Winthrop B., to Curtiss-Wright Corporation. Rotary mechanism of the type having a planetating rotor. 3,891,357, Cl. 418-61.00A.
Day, Douglas B.; and Stahl, Welfred A., to United States of America, Air Force. Retrieval assembly. 3,891,165, Cl. 244-137.00R.
Day, Ian: *See—*
Hoggan, Donald; Wright, Ernest Walter; and Day, Ian, 3,890,820.
Day Star Corporation: *See—*
Ernst, G. Fred; and Faulkner, William P., 3,890,762.
Dayco Corporation: *See—*
Gordon, Daniel J., 3,890,860.
Huber, Walter E., 3,891,405.
Kleykamp, Donald L., 3,891,007.
De Francisci Machine Corporation: *See—*
Bontempi, Ignatius; and Giemisch, Peter, 3,891,192.
Dead Sea Works Ltd.: *See—*
Becker, Alan M.; Epstein, Joseph A.; Lupin, Michael S.; and Zolotov, Shaul, 3,891,544.
Dean Foods Company: *See—*
Green, Dan E.; and Hanover, L. Mark, 3,891,771.
Debaigt, Jean, to C.G.E.E.-Alsthom. Fixing device for a support means. 3,891,295, Cl. 339-198.0GA.
Debost, Jean-Pierre; and de Malartic, Jacques Mezan, to U.S. Philips Corporation. Circuit arrangement for adapting a load network to a transceiver. 3,891,947, Cl. 333-17.000.
Debray, Werner, to Siemens Aktiengesellschaft. Weld-plating of steel. 3,891,820, Cl. 219-76.000.
de Charsonville, Jacques, to Cefilac. Process for hot extruding metals. 3,890,818, Cl. 72-42.000.
Decio Maraglio: *See—*
Bassani, Giancarlo, 3,890,738.
Decker, Hanns; Hurtmanns, Heinz; and Stockmann, Helmut, to Klocker-Humboldt-Deutz, AG. Lubricant feed means for gyratory crushers. 3,891,153, Cl. 241-214.000.
De Cordova, James: *See—*
Shelly, Jacques, 3,891,235.
De Corso, Serafino M., to Westinghouse Electric Corporation. Graphite-lined inert gas arc heater. 3,891,828, Cl. 219-383.000.
Dederra, Carl-Helmut: *See—*
Schmidt, Gunther; Theiss, Armin; Dederra, Carl-Helmut; and Kaiser, Leonhard, 3,890,781.
Deere & Company: *See—*
Miller, Wayne Russel; and Lucke, Robert James, Jr., 3,890,995.
Deering Milliken Research Corporation: *See—*
Frentress, Zane, 3,891,911.
Dejoux, Andre: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.
De Koning, Jan; and Van Der Ven, Romke, to Ballast-Nedam Group N.V. Method of building a tunnel and tunnel built according to said method. 3,890,791, Cl. 61-43.000.
Delestrade, Andre; and Marce, Roger, to Compagnie Francaise des Petroles; and Compagnie Generale d'Automatisme. Device for measuring the position and speed of a boring tool. 3,891,038, Cl. 175-7.000.
Delker, Thomas C.: *See—*
Snoberger, Robert C.; Delker, Thomas C.; and Reschly, Richard L., 3,891,231.
De Loye, Martin, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Binary coding device. 3,891,793, Cl. 178-6.000.
DeLuca, Bruno, to Centro Sperimentale Metallurgico S.p.A. Apparatus for deforming sheet metal blanks by fluid pressure. 3,890,819, Cl. 72-57.000.
De Lucia, Victor E. Pressurized relay assembly. 3,891,950, Cl. 335-151.000.
de Malartic, Jacques Mezan: *See—*
Debost, Jean-Pierre; and de Malartic, Jacques Mezan, 3,891,947.
Deml, Reinhold; Greis, Ulrich; Bestenreiner, Friedrich; and Helmberger, Josef, to Agfa-Gevaert Aktiengesellschaft. Method and arrangement for recording the phase distribution of an object wave stored in a hologram. 3,891,975, Cl. 340-173.0LM.
Demmel, Edward J.; Nace, Donald M.; Owen, Hartley; and Rosinski, Edward J., to Mobil Oil Corporation. Combination operation to maximize fuel oil product of low pour. 3,891,540, Cl. 208-77.000.
De Montmollin, Rene; and Riat, Henri, to Ciba-Geigy AG. Azodyestuffs containing α,β-dichloropropionylamino or α,β-dibromopropionylamino groups. 3,891,618, Cl. 260-163.000.
Den-Tal-Ez Mfg. Co.: *See—*
Gerlich, Irvin V., 3,890,986.
Deneke, Klaus: *See—*
Bellan, Alfred; and Deneke, Klaus, 3,891,745.
Denis, Jean-Claude: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,891,765.
D'Entremont, Donald J., to W. R. Grace & Co. Multi-layer thermoplastic film and method of making same. 3,891,008, Cl. 138-146.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1H-imidazo(4,5-c)pyridine-7-carboxylic acids and esters. 3,891,660, Cl. 260-295.50B.
Depew, Chester: *See—*
Gaines, Clarence; and Depew, Chester, 3,890,768.
Deproux, Jacques Roland, to Compagnie Honeywell Bull (Societe Anonyme). Endless type-carrying tape for printing machine. 3,890,895, Cl. 101-111.000.
Derible, Pierre Henri; and Lavaux, Jean-Paul, to Roussel Uclaf. 10-(Piperidino-alkyl) -phenothiazines. 3,891,636, Cl. 260-243.00A.
Descamps, Marcell; and Areschka, Alex, to Labaz. 2-[(1,4-Benzodioxan)-2-yl]-acetamidines. 3,891,648, Cl. 260-268.0BC.
Deseret Pharmaceutical Co., Inc.: *See—*
Moorehead, Harvey Robert, 3,890,956.
Desmarais, Armand J., to Hercules Incorporated. Joint cement compositions utilizing water-insoluble carboxymethylated cellulose derivatives as asbestos substitutes. 3,891,582, Cl. 260-17.00R.
DeSoto, Inc.: *See—*
Sekmakas, Kazys, 3,891,527.
Destrade, Michel; and Vassort, Jean-Luc, to Thomson-CSF. Microwave filter using hybrid circuit and resonators. 3,891,948, Cl. 333-73.00W.
Detton, Jean: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.
Deumens, Johannes J. M.: *See—*
Verheijen, Egidius J. M.; Thoma, Jozef A.; and Deumens, Johannes J. M., 3,891,678.
Deutsche Babcock & Wilcox Aktiengesellschaft: *See—*
Meyer, Georg Michael, 3,891,411.
Dever, James L.: *See—*
Marciniak, Harry W.; Carlson, Richard D.; and Dever, James L., 3,891,599.
DeVita, William R., to Structural Foam Products, Inc. Apparatus for molding foamed thermoplastic articles. 3,891,362, Cl. 425-4.00R.
Di/An Controls, Inc.: *See—*
Kodis, Robert D., 3,890,893.
Diamond, Julius, to William H. Rorer, Inc. Pseudothiuronium compounds. 3,891,704, Cl. 260-564.00E.

Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. S-triazines. 3,891,705, Cl. 260-565.000.

Dian, Walter, to Beatrice Foods Company. Front derailler for bicycles. 3,890,847, Cl. 74-217.00B.

Diana, G.y D.; and Hinshaw, William B., Jr., to Sterling Drug Inc. Esters of aryl-aliphatic alcohols. 3,891,674, Cl. 260-340.500.

Diassi, Patrick Andrew; and Atwal, Manmohan Singh, to E. R. Squibb & Sons, Inc. Process for the preparation of 6-(d-2-amino-2(1,4-cyclo-hexadienyl)acetamido) penicillanic acid. 3,891,629, Cl. 260-239.100.

Diefenbach, Peter C. Tennis racket with interchangable string frame. 3,891,211, Cl. 273-73.00L.

Diepers, Heinrich; Musebeck, Horst; and Wirkner, Eduard, to Siemens Aktiengesellschaft. Method for the manufacture of a composite wire with an aluminum core and niobium cladding. 3,890,700, Cl. 29-599.000.

Diepers, Heinrich, to Siemens Aktiengesellschaft. Process for the production of a composite wire having an aluminum core and a niobium cover. 3,890,701, Cl. 29-599.000.

Diesel, William J.: *See*—
Loose, Guenter H.; Diesel, William J.; and Graczyk, Thadeus S., 3,890,892.

Dietiker, Ernst, to Maschinenfabrik Schweiter AG. Lubricated yarn guide for yarn spooling machine. 3,891,154, Cl. 242-43.000.

Diggins, Dennis R., to Ramirez, Daniel M. Safety glove for football players. 3,890,649, Cl. 2-161.00A.

Digmor Equipment & Engineering: *See*—
Miller, Laurence B.; and Crook, James D., 3,891,035.

Dimeff, John, to United States of America, General Counsel-Code GP. Tachometer circuit. 3,891,925, Cl. 324-169.000.

Dinkelbach, Anton: *See*—
Weber, Karl-Heinz; and Dinkelbach, Anton, 3,891,861.

Ditcher, John, to A-Lok Corporation. Joint assembly for vertically aligned sectionalized manhole structures incorporating D-shaped gaskets. 3,891,224, Cl. 277-207.000.

Dobras, Bruce W., to Monarch Marking Systems, Inc. Coded records, method of making same and method and an apparatus for reading coded records. 3,891,829, Cl. 235-61.11E.

Dochterman, Richard W., to General Electric Company. Dynamoelectric machine having improved lubrication system. 3,891,878, Cl. 310-90.000.

Doehling, Theodore W.: *See*—
Kratsch, Henry W.; and Doehling, Theodore W., 3,891,134.

Doldouras, George A.: *See*—
Kollonitsch, Janos; Scott, Alan N.; and Doldouras, George A., 3,891,668.

Domenico, Penelope B., to Dow Chemical Company, The. Halopyridyl thioalkylthiocyanates. 3,891,659, Cl. 260-294.80F.

Domig, Rene, to Aktiengesellschaft Gebruder Loepfe. Apparatus for monitoring a thread or the like. 3,890,810, Cl. 66-161.000.

Donakowski, William A.: *See*—
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,534.
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,542.

Doolin, John H., to Worthington Pump International, Inc. Supporting foot means for a separately coupled centrifugal pump. 3,891,345, Cl. 415-121.00R.

Doran, Ronald W.: *See*—
Weeks, Lorne E.; and Doran, Ronald W., 3,891,393.

Doss, Ravindra Nath: *See*—
Rao, Hattangady Vasanth; and Doss, Ravindra Nath, 3,891,913.

Dotzer, Richard; and Plundrich, Winfried, to Siemens Aktiengesellschaft. Chemical recording of flow patterns. 3,890,835, Cl. 73-147.000.

Douglas, George H.: *See*—
Diamond, Julius; and Douglas, George H., 3,891,705.
Teller, Daniel M.; Guinosso, Charles J.; Bell, Stanley C.; and Douglas, George H., 3,891,665.

Dow Chemical Company, The: *See*—
Crowe, Curtis W., 3,891,566.
Domenico, Penelope B., 3,891,659.
Kenaga, Eugene E., 3,891,767.
Larsen, Eric R.; and Ecker, Ernest L., 3,891,605.
Layne, Gilbert S.; and Huml, James O., 3,891,690.
Marzolf, Richard T., 3,891,598.
O'Melia, Frances C., 3,891,760.
Shea, Philip J.; and Abdallah, Abdulmuniem H., 3,891,769.

Dowley, Mark W.; and Shull, William A., to Liconix. Long life helium metal vapor laser. 3,891,943, Cl. 331-94.50G.

Downing, Todd R.; and Nolen, Robert K., to Maremont Corporation. Hanger for suspending exhaust pipes from a horizontal support. 3,891,176, Cl. 248-340.000.

Dowty Rotol Limited: *See*—
Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, 3,891,346.

Drabek, Jozef; and Varsanyi, Denis, to Ciba-Geigy Corporation. O-alkyl-S-alkyl-O-substituted phenyl-thiophosphoric acid esters. 3,891,728, Cl. 260-955.000.

Draf Tool Co., Inc.: *See*—
McKenzie, James M.; and Sachs, Jeffrey L., 3,890,836.

Dragerwerk Aktiengesellschaft: *See*—
Warncke, Ernst, 3,890,647.

Dragomier, John D.; and Zysset, Edgar H., to Van Dorn Company. Easy-opening can end construction. 3,891,117, Cl. 220-270.000.

Dreibelbis, Richard C., to Emerson Electric Co. Means for storing and dispensing heated liquid with expansion chamber module and system therefor. 3,891,124, Cl. 222-66.000.

Dreikorn, Barry A., to Eli Lilly and Company. Substituted 4-5 dehydrotetrazolo(1,5-a)quinolenes. 3,891,653, Cl. 260-288.0CF.

Dresler, Helmut, to Linde Aktiengesellschaft. Automatic pressure-control valve, especially for a pressurized-gas supply installation. 3,890,997, Cl. 137-271.000.

Dressel, Waldemar M.: *See*—
Cole, Ernest R., Jr.; Dressel, Waldemar M.; and Smith, Lawrence L., 3,891,430.

Dresser Industries, Inc.: *See*—
Cope, Geoffrey Wilton, 3,891,277.
Nick, Charles F.; and Davidson, Morris J., 3,890,832.

Drew, Marie. Hydrotherapy apparatus. 3,890,965, Cl. 128-66.000.

Drews, Ulrich: *See*—
Werner, Peter; and Drews, Ulrich, 3,890,944.

Drexel, Richard Jacob, Jr.: *See*—
Morris, Horton Harold; Drexel, Richard Jacob, Jr.; and Turner, Kenneth Lamar, 3,891,580.

Drisko, Richard W.; and Crilly, Joseph B., to United States of America, Navy. Quick setting adhesive for application underwater. 3,891,583, Cl. 260-18.0EP.

Driver, Anna P. Combined card and poker chip holder. 3,891,220, Cl. 273-150.000.

Drostholm, Frede Hilmar; Petersen, Kaj Ditlev Frederik; and Raabo, Ulf, to Frede Hilmar Drostholm. Integrated apparatus for distilling batches of contaminated solvents. 3,891,510, Cl. 202-206.000.

Dubois, Donald W.: *See*—
Carlin, William W.; Darlington, William B.; and Dubois, Donald W., 3,891,741.

Du Corday, Gerard M. Book cover. 3,891,240, Cl. 281-29.000.

Dulude, Donald O.; and Winbigler, Paul H., to Kuhlman Corporation. Methods for the manufacture of spring assemblies. 3,891,823, Cl. 219-85.000.

Dumoulin, Bernard. Enrobing apparatus. 3,890,923, Cl. 118-19.000.

Dunn, George L.; and Hoover, John R. E., to SmithKline Corporation. P-Hydroxymethylphenylacetamidocephalosporins. 3,891,634, Cl. 260-243.00C.

Dunton, Roy P.: *See*—
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P., 3,890,772.

du Pont de Nemours, E. I., and Company: *See*—
Chang, David Chi-kung; and McDowell, Maurice James, 3,891,591.
Klever, Harold Howard, 3,891,725.
Kogon, Irving Charles, 3,891,606.
Ramsey, Harold Eugene, 3,890,761.
Shearon, Michael Hillas; and Besel, Roland Leroy, 3,891,158.
Wolfe, James Richard, Jr., 3,891,604.
Wolfe, Paul Dillon; Saxton, Ronald Luther; and Cameron, Donald Dean, 3,891,609.

Durant, Graham John: *See*—
Black, James Whyte; and Durant, Graham John, 3,891,764.

Durrant, Graham: *See*—
Phillipps, Gordon Hanley; Bain, Brian MacDonald; and Durrant, Graham, 3,891,631.

Duttarer, Ralph M.; and Hushower, Richard R., to Clark Equipment Company. Hydraulic manifold. 3,891,003, Cl. 137-561.00A.

Dworak, Wilhelm; Jons, Claus; and Vlemmings, Jan, to Robert Bosch G.m.b.H. Gear machine with axially movable end wall seal. 3,891,360, Cl. 418-132.000.

Dyck, Gerhard J. Grain moisture tester. 3,890,830, Cl. 73-73.000.

Dynamit Nobel AG: *See*—
Bellan, Alfred; and Deneke, Klaus, 3,891,745.

E. B. Wiggins, Inc.: *See*—
Nadsady, Clarence A.; and Cannon, Clifford D., 3,891,291.

E. R. Squibb & Sons, Inc.: *See*—
Denzel, Theodor; and Hoehn, Hans, 3,891,660.
Diassi, Patrick Andrew; and Atwal, Manmohan Singh, 3,891,629.
Hauck, Frederic Peter; and Sundeen, Joseph E., 3,891,652.
Ondetti, Miguel Angel, 3,891,616.

E-T Industries, Inc.: *See*—
Davis, Dalton M., 3,891,343.

Eagleton, Harold N.; Lormand, Jerome D.; and Herring, Joe S. Method for controlled pressurization of a pipeline during construction thereof. 3,890,693, Cl. 29-429.000.

Eastman Kodak Company: *See*—
Allen, Robert P.; and Hagemeyer, Hugh J., Jr., 3,891,679.
Beavers, Dorothy Johnson, 3,891,442.
Gibbons, Carl B., 3,891,844.
Janusonis, Gaile A., 3,891,446.
Laffitte, Royce D., 3,891,746.
Loose, Guenter H.; Diesel, William J.; and Graczyk, Thadeus S., 3,890,892.

Ebauches S.A.: *See*—
Aeschmann, Marc, 3,890,778.

Ebbler, Robert W.: *See*—
Mowrer, Ronald L.; Ebbler, Robert W.; and Gates, Major F., 3,891,002.

Ebner, Heinrich; and Enenkel, Anton, to Heinrich Frings, Firma. Device for aerating liquids. 3,891,729, Cl. 261-87.000.

Ecker, Ernest L.: *See*—
Larsen, Eric R.; and Ecker, Ernest L., 3,891,605.

Eckhardt, Wilhelm; and Kuster, Klaus, to Kuster & Co. GmbH. Vehicle window lifter. 3,890,743, Cl. 49-352.000.

Eckstein, George R., to Remington Arms Company, Inc. Shaping and turning machine. 3,890,682, Cl. 29-1.300.

Edgerton, Philip, to FMC Corporation. Peripheral feed clarification tank. 3,891,557, Cl. 210-519.000.

Educational Machinery Corporation: *See—*
Pracilio, Francis Paul, 3,891,369.

Edwards, Lawrence K. Railway system. 3,890,904, Cl. 104-121.000.

Edwin Cooper & Company Limited: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, 3,891,726.

Efrudec-Vertriebsgesellschaft mbH fur Industrieprodukte aus Metall und Kunststoff: *See—*
Wunsch, Friedgard, nee Kuhn; and Wunsch, Erich, 3,890,960.

Egan, Gary L., to Hewlett-Packard Company. Synchronous sequential controller for logic outputs. 3,891,972, Cl. 340-172.500.

Ehlers, Randall G., to Burroughs Corporation. Method and apparatus for identifying an invalid character code. 3,891,839, Cl. 235-153.0AS.

Ehlert, Elmer R. Trailer hitch. 3,891,238, Cl. 280-446.00R.

Ehrlick, Robert; and Young, Archie R., II, to Thiokol Corporation. Preparation of aluminum hydride trialkylaminates. 3,891,686, Cl. 260-448.00R.

Einhorn, Ruediger, to Coats & Clark, Inc. Support member having a locking cam. 3,891,172, Cl. 248-223.000.

Eisenberg, Morris, to Electrochimica Corporation. Electric current producing galvanic cell. 3,891,458, Cl. 136-6.0LN.

Ejima, Mizuo: *See—*
Yoshida, Kiyota; and Ejima, Mizuo, 3,891,472.

Elam, James O.; and Ruben, Henning M., to Elam, James O. Breathing indicator and ventilator. 3,890,967, Cl. 128-202.000.

Elco Industries, Inc.: *See—*
Gutshall, Charles E., 3,891,296.

Electro-Coatings, Inc.: *See—*
Paulson, Peter C.; Henderson, Henri H.; and Worstell, Richard L., 3,891,515.

Electrochimica Corporation: *See—*
Eisenberg, Morris, 3,891,458.

Electronized Chemicals Corporation: *See—*
Kierstead, William L., 3,891,790.

Eli Lilly and Company: *See—*
Dreikorn, Barry A., 3,891,653.

Elizondo-Garcia, Javier. Basket for the carrying of all types of bottles. 3,891,084, Cl. 206-143.000.

Elkamet-Werk Lohn-Kunststoff: *See—*
Giehler, Herbert, 3,891,370.

Elkem-Spigerverket A/S: *See—*
Hyggen, Egil, 3,891,018.

Ellens, Gordon A.: *See—*
Cook, William J.; and Ellens, Gordon A., 3,891,274.

Ellingson, Herman E.; and Lieberman, Gilbert, to United States of America, Navy. Single command acoustical guidance system. 3,890,913, Cl. 114-20.00R.

Elliott, Angelika: *See—*
Elliott, John, 3,890,955.

Elliott, John, to Elliott, Angelika. Vacuum indicator. 3,890,955, Cl. 128-2.00F.

Elliott, John Scotchford; Davis, Bryan Terence; and Crook, Monty Frederick, to Edwin Cooper & Company Limited. Heterocyclic phosphorus compounds. 3,891,726, Cl. 260-927.00R.

Ellis, James F. Linear displacement transducer utilizing an oscillator whose average period varies as a linear function of the displacement. 3,891,918, Cl. 324-34.00D.

Ellis, James P.; and Ridgeway, William G. Light support for boats. 3,891,173, Cl. 248-226.00A.

Ellison, Donald E.; and Davenport, Larry C., to Inland Container Corporation. Corrugated container having access door. 3,891,137, Cl. 229-44.00R.

Elsas, Tibor, to Norland Gazelle Travel Goods Limited. Luggage trolleys. 3,891,245, Cl. 280-47.13R.

Elsbett, Gunter: *See—*
Elsbett, Ludwig; and Elsbett, Gunter, 3,890,949.

Elsbett, Ludwig; and Elsbett, Gunter. Twist turbulence forming passage, especially in the intake system of reciprocable internal combustion engines. 3,890,949, Cl. 123-188.00M.

Elster AG: *See—*
Paetzold, Wolf, 3,890,838.

Elsters, Inc.: *See—*
Kaufman, Arnold S.; and Sweet, Albert, 3,890,887.

Eltro GmbH Gesellschaft Fuer Strahlung Stechnik: *See—*
Meinke, Hans Heinrich; Flachenecker, Gerhard; Landstorfer, Friedrich; Lindenmeier, Heinz; and Fastenmeier, Karl, 3,891,319.

Emco Limited: *See—*
Hunter, Edward W., 3,891,119.

Emerson Electric Co.: *See—*
Dreibelbis, Richard C., 3,891,124.

Enenkel, Anton: *See—*
Ebner, Heinrich; and Enenkel, Anton, 3,891,729.

Engels, Siegfried: *See—*
Stosberg, Herbert; Fleishmann, Horst; Reinhards, Gunter; and Engels, Siegfried, 3,890,668.

Engle, Thomas H., to General Signal Corporation. Pneumatic to hydraulic converter with parking brake. 3,890,786, Cl. 60-547.000.

Englert, Thomas A.: *See—*
Ardezzone, Frank J.; and Englert, Thomas A., 3,891,924.

English Electric Valve Company Limited: *See—*
Barry, David Edward; and Steigmann, Peter Edward, 3,891,887.

English, Paul Nelson. Wet environment radiography apparatus. 3,891,845, Cl. 250-321.000.

Ensmann, Burt; Ieda, Michael; and, Joshi, Madhusdan, to Ideal Toy Corporation. Gunfight game. 3,891,216, Cl. 273-119.00R.

Epstein, Joseph A.: *See—*
Becker, Alan M.; Epstein, Joseph A.; Lupin, Michael S.; and Zolotov, Shaul, 3,891,544.

Erhard, Paulus: *See—*
Petersen, Harro; Erhard, Paulus; Queins, Hubertus; and Schoeppl, Hubert, 3,891,608.

Erickson, Porter W.; and Hellfritzsch, Alvin G., to United States of America, Navy. Attachment device. 3,891,466, Cl. 136-200.000.

Erikson, J. Alden: *See—*
Irwin, James; and Erikson, J. Alden, 3,891,525.

Erlinger, Gary K.: *See—*
Baker, Richard J.; Miller, Timothy A.; Erlinger, Gary K.; Loepiktie, Stephanus F.; and Hanselman, Larry R., 3,891,774.

Ernst, G. Fred; and Faulkner, William P., to Day Star Corporation. Produce shipping container and packing method. 3,890,762, Cl. 53-25.000.

Ernst, Horst; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company, B.V. Longitudinally moving shaft bearing. 3,891,284, Cl. 308-6.00C.

Ernst Leitz GmbH: *See—*
Hock, Fromund, 3,891,321.
Hock, Fromund, 3,891,322.

Ernst, Robert; and Miller, Eugene J., to Textilana Corporation. Acylamidoethoxyethyl sulfosuccinate salts, methods of producing the same and froth-forming compositions containing the same. 3,891,682, Cl. 260-401.000.

Erwin, Ransome W., to Austral-Erwin Engineering Co. Method of heat exchange and evaporation. 3,891,496, Cl. 159-47.00R.

ESB Incorporated: *See—*
Nordblom, George F., 3,891,447.

Escher Wyss Limited: *See—*
Winkler, Robert, 3,891,395.

Essers, Wilhelmus Gerardus; and Jelmorini, Gerardus, to U.S. Philips Corporation. Method of plasma-MIG-welding. 3,891,824, Cl. 219-121.00P.

Ethicon, Inc.: *See—*
McGregor, Walter, 3,890,975.

Ethyl Corporation: *See—*
Braxton, Henry G., Jr.; and Lehikoinen, U. Albert, 3,891,448.
Braxton, Henry G., Jr.; Griffing, Margaret E.; and Jolly, James G., 3,891,449.

Etudes et Bonneterie S.A.: *See—*
Bourgeois, Norbert Paul, 3,890,805.

Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., to International Flavors & Fragrances Inc. Novel 3-thia alkane-1,4-diones. 3,891,710, Cl. 260-593.00R.

Evertz, Egon. Method for repairing iron molds used in steel making, casting plates in iron molds and other objects made of cast iron. 3,891,821, Cl. 219-76.000.

Exxon Production Research Company: *See—*
Herbert, Curtis B., Jr., 3,891,963.

Exxon Research and Engineering Company: *See—*
Jung, Herbert A., 3,891,684.
Nahas, Nicholas C.; and Wilson, Edward L., 3,891,402.

F. B. Hatebur A.G.: *See—*
Kuhn, Hans, 3,891,260.

Fa. Gulde-Regelarmaturen KG: *See—*
Wolz, Werner; Bender, Hans; and Schmitt, Manfred, 3,890,992.

Fader, Lester. Apparatus for simulating a three-dimensional image by use of plural image producing surfaces. 3,891,305, Cl. 350-144.000.

Fairchild Camera and Instrument Corporation: *See—*
Amelio, Gilbert F.; Livezey, Jack A.; and Salsbury, Phillip J., 3,891,977.

Falk, David O.: *See—*
Norton, Charles J.; and Falk, David O., 3,891,567.

Fall, Janet E. Inflatable wig tote. 3,891,082, Cl. 206-8.000.

Fantoni, Marco, to McClure Furniture Industries, Inc. Recessed hinges for articles of furniture. 3,890,671, Cl. 16-137.000.

Fantoni, Marco, to McClure Furniture Industries, Inc. Pushbutton lockset mechanism. 3,890,814, Cl. 70-106.000.

Far-Mar-Co., Inc.: *See—*
Rao, Ganta V.; and Gerrish, Oliver B., Sr., 3,891,613.

Farfaglia, Silvio T.; Coburn, Leslie O.; Halpin, Robert G.; and Bock, Ronald E., to Phillips Petroleum Company. Carton forming machine. 3,890,765, Cl. 53-183.000.

Farona, Michael F.; and White, James F., to University of Akron, The. Method for producing aromatic sulfones. 3,891,713, Cl. 260-607.00A.

Fassett, Donald G.; and Thompson, Ralph F. Welding hood. 3,890,646, Cl. 2-8.000.

Fastenmeier, Karl: *See—*
Meinke, Hans Heinrich; Flachenecker, Gerhard; Landstorfer, Friedrich; Lindenmeier, Heinz; and Fastenmeier, Karl, 3,891,319.

Faulkner, William P.: *See—*
Ernst, G. Fred; and Faulkner, William P., 3,890,762.

Fazio, James Anthony, to Singer Company, The. Color convergence apparatus for a color television tube. 3,891,889, Cl. 315-368.000.

Feil, Fred W., to Continental Display Corporation. Retaining clip. 3,891,335, Cl. 403-173.000.

Feiring, Monroe J., to Gulf & Western Manufacturing Company. Sealing and seat assembly for ball valve construction. 3,891,183, Cl. 251-315.000.

Fekete, Eugene Zoltan; and Grady, Raymond J., to Huyck Corporation. Apparatus for needling textiles. 3,890,681, Cl. 28-4.00R.

Felice, Patrick E.; and Ferber, Robert R., to Westinghouse Electric Corporation. Means for integrating erythemal spectral radiation. 3,891,849, Cl. 250-372.000.

Feltz, Albert John, to Singer Company, The. Gear mechanism for producing periodic rotation. 3,890,853, Cl. 74-435.000.

Fencl, Miroslav. Structure of coordinated modular building construction. 3,890,748, Cl. 52-79.000.

Fenner, Hans-Ueli: *See—*
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,891,819.

Fensvig, Jens Andreas Toft: *See—*
Trostmann, Erik; and Fensvig, Jens Andreas Toft, 3,890,839.

Ferber, Robert R.: *See—*
Felice, Patrick E.; and Ferber, Robert R., 3,891,849.

Fernandez, Alberto; and Quintero, Eduardo. Material applying dispenser having screw actuated feed. 3,891,127, Cl. 222-387.000.

Ferodo Limited: *See—*
Odier, Jean, 3,891,398.

Ferraro, Frank A., to Warner-Lambert Co. Razor blade cartridge. 3,890,704, Cl. 30-47.000.

Fessler, Andreas; and Fessler, Ewald, to Hochland, Reich, Summer & Co. Apparatus for interleaving sheets of paper between individual slices of cheese for packages of sliced cheese. 3,890,886, Cl. 93-93.00D.

Fessler, Ewald: *See—*
Fessler, Andreas; and Fessler, Ewald, 3,890,886.

Fiedelman, Howard W., to Morton-Norwich Products, Inc. Crystallization of sodium chloride of reduced calcium sulfate content in presence of about 5 to about 500 ppm. 3,891,397, Cl. 23-300.000.

Field, Peter G. S.; and Lock, David A., to Burmah Oil Trading Limited. Production of ketones. 3,891,711, Cl. 260-597.00R.

Fields, Ellis K., to Standard Oil Company. Arylation process. 3,891,656, Cl. 260-290.00R.

Fields, Meredith. Multi-purpose lift device. 3,891,184, Cl. 254-4.00R.

Fieni, Walter, to Societe Anonyme Francaise du Ferodo. Safety belt system. 3,891,271, Cl. 297-386.000.

Fierst, Jeannette I. Reinforced foundation construction. 3,890,979, Cl. 128-555.000.

Filaferro, Rene; and Hebert, Francois, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Phase correction device for demodulation of bipolar signals. 3,891,927, Cl. 325-421.000.

Findeiss, Helmut: *See—*
Bauer, Kurt; Findeiss, Helmut; and Krempel, Alfred, 3,891,781.

Finke, Harry P.: *See—*
Hovis, James E.; Johns, James E.; and Finke, Harry P., 3,891,384.

Finnell, Joseph C., to McDonnell Douglas Corporation. Plating area measuring system. 3,891,797, Cl. 178-6.800.

Finneman, Erwin F. Catwalk for vehicle boxes. 3,891,261, Cl. 296-1.00R.

Firestone Burleigh Marine Pneumatic Fendering Company Limited: *See—*
Ackroyd, John Morton; and Hart, Graham Arthur Nigel, 3,890,917.

Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie: *See—*
Reinhards, Gunter, 3,890,669.

Fischel, Halbert, to Baxter Laboratories, Inc. Cardiopulmonary bypass system. 3,890,969, Cl. 128-214.00R.

Fischer, Charles F., to Colgate-Palmolive Company. Apparatus for making a striated soap bar. 3,891,365, Cl. 425-131.100.

Fischer, Hermann, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Directionally reversible rotary offset printing machine and wetting system therefor. 3,890,898, Cl. 101-148.000.

Fishburne, Francis B. Material compacting and disposal apparatus. 3,890,889, Cl. 100-48.000.

Fister, Louis P.; and Paine, Robert, to Moog Automotive, Inc. Physiological diagnostic apparatus. 3,890,958, Cl. 128-2.00S.

Flachenecker, Gerhard: *See—*
Meinke, Hans Heinrich; Flachenecker, Gerhard; Landstorfer, Friedrich; Lindenmeier, Heinz; and Fastenmeier, Karl, 3,891,319.

Flachglas Aktiengesellschaft DELOG-DETAG: *See—*
Glaser, Hans-Joachim; and Brandt, Hans-Werner, 3,891,536.

Flanagan, James Loton; and Jayant, Nuggehally Sampath. Digital signal detection in telephonic communication systems. 3,891,805, Cl. 179-15.0BF.

Flanagan, Thomas P.: *See—*
Ray-Chaudhuri, Dilip K.; Schoenberg, Jules E.; and Flanagan, Thomas P., 3,891,584.

Fleck, Fritz; and Schmid, Hans Rudolf, to Sandoz Ltd. Triazolylstyryl compounds. 3,891,632, Cl. 260-240.00D.

Fleishmann, Horst: *See—*
Stosberg, Herbert; Fleishmann, Horst; Reinhards, Gunter; and Engels, Siegfried, 3,890,668.

Fleissner, Hans, to Vepa AG. Padder-type apparatus for the continuous application of liquids to permeable materials. 3,890,811, Cl. 68-200.000.

Flemming, Helmut, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension for motor vehicles. 3,891,232, Cl. 280-124.00A.

Flickinger, Erich: *See—*
Danneil, Axel; Flickinger, Erich; Graefje, Heinz; Plass, Reinhold; and Schnur, Rudolf, 3,891,511.

Flintkote Company, The: *See—*
Califano, Frank L.; Stepien, George, Jr.; and Russell, Thomas E., 3,891,586.

Flotow, Richard Allen: *See—*
Sink, William Howard; and Flotow, Richard Allen, 3,891,072.

Floyd, Don D.; and Whittle, Lee M. Tagging attachment for hay baler. 3,890,891, Cl. 100-102.000.

Flus, Friedrich: *See—*
Taege, Herbert; Flus, Friedrich; and Mertens, Gunther, 3,891,434.

FMC Corporation: *See—*
Edgerton, Philip, 3,891,557.
Knight, Houston W., 3,891,004.

Foerst, Reiner. Game board with color distinguishable play pins and bores. 3,891,219, Cl. 273-136.00F.

Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., to AMP Incorporated. Apparatus for positioning leading portions of individual wires of a plurality of wires in spaced apart relationships with respect to each other. 3,891,013, Cl. 140-147.000.

Ford Motor Company: *See—*
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,534.
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,542.
Jackson, Paul L., 3,891,512.
Ladd, Floyd N.; and Stacy, Donald G., 3,890,742.
Warsinski, Robert, 3,891,834.

Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, to Thyssen Niederrhein AG Hutten- und Walzwerke. Apparatus for treating a melt. 3,891,196, Cl. 266-34.00T.

Foster Grant Co., Inc.: *See—*
Surrette, Richard H.; and Braga, Alfred M., 3,891,092.

Fournier, Pierre: *See—*
Mardiguian, Jean; and Fournier, Pierre, 3,891,622.

Fowells, Robert W., to Crown Zellerbach Corporation. Polyolefin fibers and process of formation during polymerization. 3,891,610, Cl. 260-88.20R.

Fr. Hesser Maschinenfabrik AG: *See—*
Glas, Willi, 3,891,138.

Fradin, Maurice, to Agence National de Valorization de la Researche (ANVAR). Apparatus for removing the bones from poultry. 3,890,674, Cl. 17-11.000.

Fraioli, Anthony V.: *See—*
Frazee, Lawrence E.; and Fraioli, Anthony V., 3,890,703.

Frait, John S., to Kelsey-Hayes Company. Failsafe system for skid control systems and the like. 3,891,279, Cl. 303-21.0AF.

Franco Chimie S.a.r.l.: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,891,765.

Frank, Pierre: *See—*
Sailer, Andre Louis; and Frank, Pierre, 3,891,617.

Frank, Robert G., to PPG Industries, Inc. Shaping heat softened glass sheets by roll forming. 3,891,420, Cl. 65-106.000.

Frazee, Lawrence E.; and Fraioli, Anthony V., to Plessey Incorporated. Method of making humidity sensor. 3,890,703, Cl. 29-621.000.

Frede Hilmar Drostholm: *See—*
Drostholm, Frede Hilmar; Petersen, Kaj Ditlev Frederik; and Raabo, Ulf, 3,891,510.

Freeman, James A., to FSW Associates. Biological feedback systems. 3,890,957, Cl. 128-2.10B.

Freeport Minerals Company: *See—*
Morris, Horton Harold; Drexel, Richard Jacob, Jr.; and Turner, Kenneth Lamar, 3,891,580.

Frentress, Zane, to Deering Milliken Research Corporation. Control system for a cyclically-operated machine. 3,891,911, Cl. 318-696.000.

Frick, John G., Jr.: *See—*
Verburg, Gerald B.; Frick, John G., Jr.; and Reid, John D., 3,891,389.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. D 2-(6-Substituted-2-naphthyl)-propanals. 3,891,712, Cl. 260-599.000.

Fried, John H.: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,891,766.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Schwarz, Wilhelm, 3,891,200.

Friedlander, Sheldon K.: *See—*
Chang, Daniel P. Y.; Friedlander, Sheldon K.; and California Institute of Technology, 3,891,547.

Friedrich, Robert E.: *See—*
Yoon, Kue H.; Friedrich, Robert E.; and Sletten, Andreas M., 3,891,813.

Frisoli, David M. Projectile or cartridge injector for automatic weapons employing magazines. 3,890,729, Cl. 42-7.000.

Fritz Buser AG. Maschinenfabrik: *See—*
Klemm, Martin, 3,891,514.

Fritz Schwarzer GmbH: *See—*
Atzinger, Wolfgang, 3,891,922.

Frizzell, Joseph G.; and Hulme, Jack R., to Halliburton Company. Electronic signal multiplier for flowmeters. 3,890,837, Cl. 73-194.00E.

Froberg, Magnus L.; and Jackson, Robert F., to Owens-Corning Fiberglas Corporation. Electrically-heated melting furnace with melt cooling means. 3,891,422, Cl. 65-137.000.

Frost, Charles C., to C. L. Frost & Son, Inc. Mower blade support assembly. 3,890,773, Cl. 56-255.000.

FSW Associates: *See—*
Freeman, James A., 3,890,957.

Fuchs, Abraham M.: *See—*
Ryan, Charles C.; Siedband, Melvin D.; and Fuchs, Abraham M., 3,891,988.

Fugono, Takeshi: *See—*
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; Maeda, Kihachiro; and Ishiguro, Toshihiro, 3,891,763.

Fuhr, Karl: *See—*
Rudolph, Hans; Heine, Hans-Georg; Fuhr, Karl; and Schnell, Hermann, 3,891,524.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; and Oishi, Yasushi, 3,891,445.
Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, 3,891,570.
Tsuji, Nobuo; and Hasegawa, Eiichi, 3,891,441.

Fujii, Masamichi: *See—*
Oka, Teruhiko; and Fujii, Masamichi, 3,891,501.

Fujimoto, Ryoichi; Takasugi, Kazuo; Inose, Fumiyuki; Maio, Kenji; and Yokozawa, Norio, to Hitachi, Ltd. Refrigerator control apparatus. 3,890,798, Cl. 62-155.000.

Fujita, Jihei: *See—*
Takahara, Ichiro; Yabu, Tadahiko; and Fujita, Jihei, 3,891,796.

Fujitsu Limited: *See—*
Tsuji, Yoshikazu; and Sohma, Yukio, 3,891,959.

Fukushima, Masakazu: *See—*
Mitomo, Isamu; Kaji, Tetsunori; and Fukushima, Masakazu, 3,891,306.

Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, to Toyo Jozo Co., Ltd.; and Fuji Photo Film Co., Ltd. Process for preparing microcapsules. 3,891,570, Cl. 252-316.000.

Fulkerson, David E., to Honeywell, Inc. Bipolar semiconductor device construction. 3,891,480, Cl. 148-187.000.

Fuller Company: *See—*
Lawall, Thomas R.; and Porter, Edward S., 3,891,382.

Fulton, Howard A., to Mansfield Sanitary, Inc. Flush water valve assembly. 3,890,652, Cl. 4-58.000.

Funk, Clarence J., to United States of America, Navy. Pulsed, variable beam pattern optical measuring device. 3,891,859, Cl. 250-564.000.

Furrer, Peter: *See—*
Bichsel, Heinz F.; Furrer, Peter; and Maier, Jorg, 3,891,433.

Furuya Kogyo Kabushiki Kaisha: *See—*
Furuya, Toshitsugu, 3,890,680.

Furuya, Toshitsugu, to Furuya Kogyo Kabushiki Kaisha. Fastener. 3,890,680, Cl. 24-214.000.

G. L. Rexroth GmbH: *See—*
Bartholomaus, Reiner; Bernd, Hubert; and Liedhegener, Friedel, 3,891,145.

Gaastra B.V.: *See—*
Gaastra, Douwe, 3,890,695.

Gaastra, Douwe, to Gaastra B.V. Method of inserting a grummet or thimble in sail cloth or the like. 3,890,695, Cl. 29-458.000.

Gach, Peter P., to Sunbeam Plastics Corporation. Child-resistant closure for a container having a threaded neck. 3,891,110, Cl. 215-216.000.

Gad-Jets, Inc.: *See—*
Wyse, Harold G., 3,891,827.

Gaffney, Edward J., to Orthokinetics, Inc. Travel chair. 3,891,229, Cl. 280-41.00B.

Gaines, Clarence; and Depew, Chester, to Gaines, Clarence. Tow bar assembly for sulky. 3,890,768, Cl. 54-39.000.

Gale, William F. Periphyton sampler and method for sampling. 3,890,844, Cl. 73-421.00R.

Galecki, Glenn E.; and Oberson, Sonia R., to Olin Corporation. Chlorate removal from alkali metal chloride solutions. 3,891,747, Cl. 423-499.000.

Galis, Martin A., to Giambalvo, George. Patio door operator. 3,890,744, Cl. 49-360.000.

Gallant, Terry B., to Automation General. Control system for vehicle gates. 3,891,900, Cl. 317-139.000.

Gallaro, Anthony V.; and Hedler, Robert A., to GTE Sylvania Incorporated. Process for fabricating a color cathode ray tube screen structure incorporating optical filter means therein. 3,891,440, Cl. 96-36.100.

Gander, Gerald: *See—*
Capt, Edmond; and Gander, Gerald, 3,890,779.

Gardner, Paul C., to United States of America, Navy. Torpedo control system. 3,890,914, Cl. 114-23.000.

Gardos, Michael N.: *See—*
United States of America, National Aeronautics and Space Administration; Levin, Herman; Auker, Byron H.; and Gardos, Michael N., 3,891,452.

Gates, Major F.: *See—*
Mowrer, Ronald L.; Ebbler, Robert W.; and Gates, Major F., 3,891,002.

Gaudard, Yves: *See—*
Auriat, Edouard; and Gaudard, Yves, 3,890,802.

Gearhart-Owen Industries, Inc.: *See—*
Owen, Harrold D.; and Terrell, Jamie B., 3,891,034.

Geary, Riley R.; and Mehaffey, Dennis G. Board game apparatus. 3,891,217, Cl. 273-130.00R.

Gebhardt, Fritz, to Karl M. Reich Maschinenfabrik GmbH. Method and apparatus for sawing a panel into portions. 3,890,861, Cl. 83-23.000.

Gebhardt, James J., Jr.: *See—*
Smith, Fred T.; Munyon, Julian M.; and Gebhardt, James J., Jr., 3,891,338.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesseri m.b.H.: *See—*
Weber, Karl-Heinz; and Dinkelbach, Anton, 3,891,861.

Gebr. Hofmann KG: *See—*
Muller, Richard, 3,890,845.

Gebruder Hischmann Maschinenfabrik: *See—*
Guggenheimer, Kurt, 3,891,152.

Gec-Elliott Automation Limited: *See—*
Beeston, John Wilmot; Bryant, Greyham Frank; and Spooner, Peter David, 3,890,817.

Geiger, Leo Franklin. Truck or trailer axle overload indicator. 3,891,964, Cl. 340-52.00R.

Geldmacher, Erwin Helmut. Method for preventing the escape of tobacco crumbs or detritus at the ends of cigarettes in transparent packages. 3,890,980, Cl. 131-121.000.

General Cable Corporation: *See—*
Schmidt, Gertraud A., 3,891,791.

General Company Ltd.: *See—*
Ueyama, Seizi, 3,891,787.

General Electric Company: *See—*
Allen, Robert E.; Bartos, Jon L.; and Aldred, Peter, 3,890,816.
Auxier, Thomas A., 3,891,348.
Bricker, Francis G.; Isaacs, Jack L.; and Nobbs, Douglas C., 3,891,170.
Dochterman, Richard W., 3,891,878.
Hicks, William Robert, 3,890,985.
Isaacs, Jack L., 3,891,086.
Karszes, William M., 3,891,788.
Konrad, Charles Edward, 3,891,902.
Ladusaw, William T., 3,891,358.
Laskaris, Evangelos T., 3,891,875.
Peterson, Marvin A.; Good, Adrian J.; and Kurek, Thaddeus P., 3,891,601.

General Instrument Corporation: *See—*
Newberry, Meigs, 3,890,849.

General Motors Corporation: *See—*
Koivunen, Erkki A., 3,890,937.
McCartney, Charles P., Jr.; and Willmann, Norman L., 3,891,459.
Schroeder, Thaddeus, 3,891,965.

General Signal Corporation: *See—*
Engle, Thomas H., 3,890,786.
Philibert, Robert A., 3,891,294.
Samuelian, Maurice P.; and Buckler, Benjamin, 3,891,171.

Geneste, Georges. Telescopic lift for construction works. 3,891,062, Cl. 187-10.000.

Genta, Guido R., to American Aniline Products, Inc. Styryl dyes. 3,891,691, Cl. 260-465 00D.

Geoffrey, David Charles, to Stanley Works, The. Garage door with rolled overlapping joint for adjacent panels. 3,891,021, Cl. 160-235.000.

Geonnotti, Anthony R. Angle diamond grinding wheel. 3,890,745, Cl. 51-71.000.

Georg Fischer Aktiengesellschaft: *See—*
Burger, Hans; and Riester, Hans, 3,891,418.

George, Charles R.: *See—*
Cunningham, Willis C.; George, Charles R.; and Shryock, Stanley H., 3,891,454.

Georgiev, Georgi Tenev: *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.

Georgoudis, Paul C.: *See—*
Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Stockmann, Hans H., 3,891,695.

Gerdes, Theo, to Blau K. G. Fabrik Fuer Kraftfahrzeugteile. Sealing cover with pressure compensation channel. 3,891,114, Cl. 220-209.000.

Gerlich, Irvin V., to Den-Tal-Ez Mfg. Co. Teeth cleaning unit. 3,890,986, Cl. 132-84.00A.

Gerretz, Josef; and Zeunert, Fritz, to Wean United, Inc. Cold pilger rolling mill and method for the rolling of tubes. 3,890,821, Cl. 72-208.000.

Gerrish, Oliver B., Sr.: *See—*
Rao, Ganta V.; and Gerrish, Oliver B., Sr., 3,891,613.

Gersbeck, Rolf; Greten, Berndt; and Steininger, Hans-Peter, to Bisonwerke Bahre and Greten GmbH and Co. KG; and Hermann Berstorff Maschinenbau GmbH. Apparatus for the continuous production of chipboard or like material. 3,891,376, Cl. 425-373.000.

Gerstenacker, Klaus-Dieter: *See—*
von Klenck, Jurgen; Michel, Erich; and Gerstenacker, Klaus-Dieter, 3,890,908.

Gertsch AG: *See—*
Gertsch, Ernest; and Gertsch, Ulrich, 3,891,226.

Gertsch, Ernest; and Gertsch, Ulrich, to Gertsch AG. Releasable ski binding. 3,891,226, Cl. 280-11.35K.

Gertsch, Ulrich: *See—*
Gertsch, Ernest; and Gertsch, Ulrich, 3,891,226.

Gervais, Edouard; Levert, Henri; and Chollet, Pierre, to Noranda Mines Limited. Method for the continuous casting of metal ingots or strips. 3,891,024, Cl. 164-89.000.

Gesell, Hartmut: *See—*
Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 3,891,730.

Giambalvo, George: *See—*
Galis, Martin A., 3,890,744.
Gibbons, Carl B., to Eastman Kodak Company. Process for nondestructively testing with radioactive gas using a chill set sealant. 3,891,844, Cl. 250-303.000.
Giehler, Herbert, to Elkamet-Werk Lohn-Kunststoff. Apparatus for making hollow bodies from thermoplastic materials by rotation-melting. 3,891,370, Cl. 425-144.000.
Giemisch, Peter: *See—*
Bontempi, Ignatius; and Giemisch, Peter, 3,891,192.
Gilbert, Eugene C.; Jones, Robert E.; and Sherman, Edward, to Quaker Oats Company, The. Preparation of O-chlorophenols. 3,891,717, Cl. 260-623.00R.
Gilbreth Company: *See—*
Spiegel, William; Spiegel, Jacob; and Miller, Albert, 3,891,090.
Gilli, Paul Viktor: *See—*
Beckmann, Georg; and Gilli, Paul Viktor, 3,890,789.
Gilman, Howard lee: *See—*
Lea, Darrell Bernard; and Klein, Laszlo, 3,890,725.
Gilmour, William Dudley: *See—*
Lewis, John; and Gilmour, William Dudley, 3,891,980.
Girard, William T.; Hamilton, Thomas R.; and Waddell, Bennett N., to Caterpillar Tractor Company. Rock guard for scraper draft arm. 3,890,726, Cl. 37-124.000.
Girling Limited: *See—*
Lawrence, Raymond Keith, 3,891,069.
Pritchard, Gethyn James, 3,891,825.
Gladson, Francis M., Jr.: *See—*
Cooper, Carlos M.; and Gladson, Francis M., Jr., 3,891,554.
Glas, Willi, to Fr. Hesser Maschinenfabrik AG. Multi-compartment package for reactive compositions. 3,891,138, Cl. 229-56.000.
Glaser, Hans-Joachim; and Brandt, Hans-Werner, to Flachglas Aktiengesellschaft DELOG-DETAG. Sputter-coating apparatus. 3,891,536, Cl. 204-298.000.
Glaus, Pyle, Schomer, Burns and DeHaven, Inc.: *See—*
Smith, Gordon C., 3,891,099.
Glaxo Laboratories Limited: *See—*
Phillipps, Gordon Hanley; Bain, Brian MacDonald; and Durrant, Graham, 3,891,631.
Go, Shigeo: *See—*
Abe, Toshizo; Sakamoto, Seiho; Go, Shigeo; Maekuma, Koichi; Yamada, Yoshitaka; and Hirashima, Yasumasa, 3,891,611.
Gold, Elijah H., to Schering Corporation. Compositions useful for treating parkinsonism. 3,891,697, Cl. 260-468.00G.
Golda, Eugene: *See—*
Katz, Leon; and Golda, Eugene, 3,891,438.
Katz, Leon; Rowe, William; and Golda, Eugene, 3,891,439.
Goldberg, Edward M.: *See—*
Bazell, Seymour; Ostensen, Ralph G.; and Goldberg, Edward M., 3,890,976.
Goldberg, Joseph H. Method for spring assembly. 3,890,687, Cl. 29-173.000.
Goldman, Jeffrey B.: *See—*
Ishman, Neal H.; Lenert, Richard W.; and Goldman, Jeffrey B., 3,891,926.
Goldman, Robert N., to Telecredit, Inc. Credit verification system. 3,891,830, Cl. 235-61.70B.
Gondoh, Masaaki: *See—*
Sakakibara, Kyoichi; Gondoh, Masaaki; Shimazawa, Eiichirou; and Izumiya, Nobuo, 3,891,614.
Good, Adrian J.: *See—*
Peterson, Marvin A.; Good, Adrian J.; and Kurek, Thaddeus P., 3,891,601.
Goodwin, Charles C.; Rounsaville, David L.; and Grimm, James H., to Rexham Corporation. Peelable heat seals for packages. 3,891,089, Cl. 206-439.000.
Goodyear Tire & Rubber Company, The: *See—*
Hunter, Edward E., 3,890,927.
Hunter, Edward E., 3,891,156.
Hunter, Edward E., 3,891,494.
Milliken, Paul E., 3,890,770.
Prudence, Robert T., 3,891,721.
Scott, Kenneth W.; and Calderon, Nissim, 3,891,816.
Tausch, Harry W., 3,891,588.
Vannan, Frederick F., Jr., 3,891,740.
Watts, William A., 3,891,587.
Gordon, Daniel J., to Dayco Corporation. Silencer and support means for a metal workpiece during machining thereof. 3,890,860, Cl. 82-38.00A.
Gordon, Harold L. Magnetic golf game. 3,891,221, Cl. 273-177.00R.
Gordon, Harry W.; and Schaffner, Carl P., to Schmid Laboratories, Inc. Polyenic macrolide compositions and methods of use. 3,891,752, Cl. 424-117.000.
Gores, Kenneth W. Dental wedge. 3,890,714, Cl. 32-64.000.
Gorini, Robert F.: *See—*
Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., 3,890,911.
Goss, John B.: *See—*
Hoff, John K.; and Goss, John B., 3,891,150.
Goto, Akihiro: *See—*
Nakae, Hideo; and Goto, Akihiro, 3,891,432.
Goto, Kenji; and Ishikawa, Norikatsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning system for internal combustion engines. 3,890,945, Cl. 123-119.00A.
Goujon, Paul: *See—*
Clerc, Michel; and Goujon, Paul, 3,891,942.
Gould, William I., Jr., to United States of America, Army. Electrical safing and arming circuit. 3,890,900, Cl. 102-70.20R.
Gournelle, Maurice: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.
Gouye, Emmanuel V.: *See—*
Reinfeld, Kurt; and Gouye, Emmanuel V., 3,891,026.
Grabovac, Bosko; and Vuceta, Ivan N., to Consolidated Devices, Inc. Torque driver tool. 3,890,859, Cl. 81-52.40R.
Graczyk, Thadeus S.: *See—*
Loose, Guenter H.; Diesel, William J.; and Graczyk, Thadeus S., 3,890,892.
Grad, Raymond J.: *See—*
Fekete, Eugene Zoltan; and Grady, Raymond J., 3,890,681.
Graefje, Heinz: *See—*
Danneil, Axel; Flickinger, Erich; Graefje, Heinz; Plass, Reinhold; and Schnur, Rudolf, 3,891,511.
Graham, Donald W.: *See—*
Hannah, John; Rogers, Edward F.; and Graham, Donald W., 3,891,758.
Grandy, Andrew J. Ammunition and weapon systems. 3,890,730, Cl. 42-16.000.
Grandy, Andrew J. Ammunition and weapon systems. 3,890,732, Cl. 42-39.500.
Grandy, Andrew J. Ammunition and weapon systems. 3,890,878, Cl. 89-1.700.
Grandy, Andrew J. Ammunition and weapon systems. 3,890,880, Cl. 89-1.705.
Grange, Raymond A., to United States Steel Corporation. Method for the case carburizing of steel. 3,891,474, Cl. 148-16.500.
Gray, Frank Alexander; and Gray, John Adam. Process and apparatus for recovering bitumen from bituminous sands. 3,891,550, Cl. 210-67.000.
Gray, John Adam: *See—*
Gray, Frank Alexander; and Gray, John Adam, 3,891,550.
Gray, Roy M. Chemical dispenser for toilet. 3,890,657, Cl. 4-223.000.
Green, Dan E.; and Hanover, L. Mark, to Dean Foods Company. Method of manufacturing fermented vegetable products. 3,891,771, Cl. 426-52.000.
Greenspan, Donald J., to U.S. Medical Research & Development, Inc. Method of and apparatus for collecting cultures. 3,890,954, Cl. 128-2.00W.
Gregerson, Leslie F.; and Symonds, Gordon R., to Canadian Patents & Development Limited. Method for determining astronomic north by gyrocompass. 3,890,718, Cl. 33-301.000.
Greis, Ulrich: *See—*
Deml, Reinhold; Greis, Ulrich; Bestenreiner, Friedrich; and Helmberger, Josef, 3,891,975.
Grellet, Bernard, to Centre Stephanois de Recherches Mechaniques Hydromecanique et Frottement. Surface treatment of aluminium and aluminium alloys. 3,891,519, Cl. 204-37.00R.
Greten, Berndt: *See—*
Gersbeck, Rolf; Greten, Berndt; and Steininger, Hans-Peter, 3,891,376.
Griffin, Vernon Dale, to Chancellor Chair Company, a part interest. Device for removing coffee basket and stem. 3,891,259, Cl. 294-33.000.
Griffing, Margaret E.: *See—*
Braxton, Henry G., Jr.; Griffing, Margaret E.; and Jolly, James G., 3,891,449.
Grimm, James H.: *See—*
Goodwin, Charles C.; Rounsaville, David L.; and Grimm, James H., 3,891,089.
Griswold, Edward A. Electrostatic filtering for cleaning dielectric fluids. 3,891,528, Cl. 204-186.000.
Grogan, Daniel W. Conveyor system. 3,891,061, Cl. 186-14.000.
Grose, Ansel B. Control valve. 3,890,998, Cl. 137-436.000.
Gross, Robert D.: *See—*
Oigarden, Tarald H.; Teltscher, Erwin S.; and Gross, Robert D., 3,891,985.
Grosseau, Albert, to S. A. Automobiles Citroen. Braking system with dual independent circuits. 3,891,278, Cl. 303-21.00F.
Groth, Wolfgang: *See—*
Socha, Johannes; and Groth, Wolfgang, 3,890,807.
Grothe, Horst: *See—*
Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, 3,891,025.
Grove, Marvin H.; and Wailes, Rodney A., to M & J Valve Company. Valve apparatus and method. 3,890,991, Cl. 137-1.000.
Grozinger, Gerhard, to Mayer & Cie. Maschinenfabrik. Electrical patterning system for circular knitting machines. 3,890,806, Cl. 66-50.00R.
GTE Automatic Electric Laboratories Incorporated: *See—*
Herr, Kurt F.; Heck, Dennis A.; Lesny, Lucian J.; and Ward, Ronald L., 3,891,838.
GTE International Incorporated: *See—*
Hawley, William L.; and Lewis, Terence E., 3,891,175.
GTE Laboratories Incorporated: *See—*
Auborn, James J., 3,891,457.
Carlsen, W. John, 3,891,976.
GTE Sylvania Incorporated: *See—*
Gallaro, Anthony V.; and Hedler, Robert A., 3,891,440.
Levin, Robert E., 3,891,421.
Gueret, Jean Louis: *See—*
Morane, Bruno; and Gueret, Jean Louis, 3,891,125.

Gueret, Pierre Leopold, to International Business Machines Corporation. Josephson junction logic element. 3,891,864, Cl. 307-212.000.

Guggenheimer, Kurt, to Gebruder Hischmann Maschinenfabrik. Grate basket for hammer crushers. 3,891,152, Cl. 241-88.400.

Guinosso, Charles J.: *See—*
Teller, Daniel M.; Guinosso, Charles J.; Bell, Stanley C.; and Douglas, George H., 3,891,665.

Gulf & Western Manufacturing Company: *See—*
Feiring, Monroe J., 3,891,183.

Gullen, Robert L. Retention cannula or catheter and applicator. 3,890,970, Cl. 128-215.000.

Gunn, David T. Screw magazine mechanism for power screwdriver. 3,891,014, Cl. 144-32.000.

Gunther, Rolf, to Messerschmitt-Bolkow-Blohm GmbH. Reinforcement assembly for internally braced structures having areal outer surfaces. 3,890,749, Cl. 52-84.000.

Gutmann, Walter: *See—*
Nicolet, Rene; and Gutmann, Walter, 3,891,723.

Gutshall, Charles E., to Elco Industries, Inc. Teeter terminal clamp. 3,891,296, Cl. 339-246.000.

Haarmann & Reimer GmbH: *See—*
Bauer, Kurt; Findeiss, Helmut; and Krempel, Alfred, 3,891,781.

Habiger, Cyril W., to Caterpillar Tractor Company. Hydrostatic drive system. 3,890,788, Cl. 60-468.000.

Hachenburg, Victor, to Bell Telephone Laboratories, Incorporated. Asynchronous data transmission arrangement. 3,891,804, Cl. 179-15.0AL.

Hackstein, Karl-Gerhard; and Hrovat, Milan, to Nukem G.m.b.H. Pressed block fuel elements for gas cooled high temperature power reactors and processes for their production. 3,891,502, Cl. 176-71.000.

Haeusler, Jochen, to Siemens Aktiengesellschaft. Encoding apparatus having an improved code permitting error reading and error detection. 3,891,143, Cl. 235-61.70R.

Hagemeister, Klaus; and Wiesbock, Josef, to Motoren-und Turbinen-Union Munich GmbH. Bearing support for thermal power engines. 3,890,780, Cl. 60-39.080.

Hagemeyer, Hugh J., Jr.: *See—*
Allen, Robert P.; and Hagemeyer, Hugh J., Jr., 3,891,679.

Haisfield, Rudolph M., to United States of America, Navy. Sonar countermeasure. 3,891,961, Cl. 340-5.00R.

Haldeman, Charles W., to Megatech Corporation. Piston lubricating. 3,890,950, Cl. 123-193.00P.

Hall, Ben F.: *See—*
Tisdale, Robby R.; Rollison, Leon C.; and Hall, Ben F., 3,891,011.

Hall, Donivan L.; and Kupper, Walter E., to Reliance Electric Company. Weighing scale. 3,891,041, Cl. 177-255.000.

Hall, William P.; and Maupin, George R. Electro-optical liquid artificial horizon. 3,891,328, Cl. 356-249.000.

Halliburton Company: *See—*
Cunningham, Willis C.; George, Charles R.; and Shryock, Stanley H., 3,891,454.
Frizzell, Joseph G.; and Hulme, Jack R., 3,890,837.
Wauson, Warren C., 3,890,782.

Halpern, Gregory; and Rowe, William, to Polychrome Corporation. Mat finish photosensitive relief plates. 3,891,443, Cl. 96-79.000.

Halpin, Robert G.: *See—*
Farfaglia, Silvio T.; Coburn, Leslie O.; Halpin, Robert G.; and Bock, Ronald E., 3,890,765.

Halski, Leszek: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.

Hamamoto, Al S.: *See—*
Cusick, John H.; Brown, Alvin E.; Hamamoto, Al S.; and Bellin, Jack L. S., 3,890,831.

Hamel G.m.b.H, Zwirnmaschinen: *See—*
Horstmann, Aloys, 3,890,924.

Hamilton, Mark Scott: *See—*
Leeson, Thomas A.; and Hamilton, Mark Scott, 3,890,971.

Hamilton, Thomas R.: *See—*
Girard, William T.; Hamilton, Thomas R.; and Waddell, Bennett N., 3,890,726.

Hammann, Ingeborg: *See—*
Lorenz, Walter; and Hammann, Ingeborg, 3,891,642.

Hamre, Mervin A. Portable camping stove. 3,890,952, Cl. 126-45.000.

Han, Shu Tang: *See—*
Daane, Robert A.; and Han, Shu Tang, 3,891,497.

Hanazono, Masanobu; Asai, Osamu; and Kawakami, Kanji, to Hitachi, Ltd. Magnetic head. 3,891,995, Cl. 360-123.000.

Handwerk, Glenn E., to Colorado School of Mines Research Institute. Process for producing carbon monoxide and hydrogen. 3,891,744, Cl. 423-415.000.

Hanke, Edward F. Lockable electrical outlet. 3,891,289, Cl. 339-14.00P.

Hankison, Paul M. Dehydrating compressed air and gases. 3,891,410, Cl. 55-20.000.

Hannah, John; Rogers, Edward F.; and Graham, Donald W., to Merck & Co., Inc. Fungicial and anthelmintic 1-phosphorylated benzimidazoles. 3,891,758, Cl. 424-200.000.

Hanover, L. Mark: *See—*
Green, Dan E.; and Hanover, L. Mark, 3,891,771.

Hanselman, Larry R.: *See—*
Baker, Richard J.; Miller, Timothy A.; Erlinger, Gary K.; Loepiktie, Stephanus F.; and Hanselman, Larry R., 3,891,774.

Hanson, Raymond, to USM Corporation. Surface treatments. 3,890,664, Cl. 12-146.00B.

Harada, Yoshiro; and Hed, A. Z., to United States of America, Air Force. Chemical protection of asbestos. 3,891,461, Cl. 136-86.00E.

Hare, Alan William: *See—*
Choules, Marcel Henry; and Hare, Alan William, 3,891,191.

Hari, Stefan; and Ronco, Karl, to Ciba-Geigy Corporation. Azomethine copper complex dyes and process for their preparation. 3,891,685, Cl. 260-438.100.

Harman, Charles P.: *See—*
Bennett, David B.; and Harman, Charles P., 3,891,939.

Harris-Intertype Corporation: *See—*
Sarka, Albert J., 3,891,437.

Harris, James E.; and Regan, Patrick E. Heavy equipment handler. 3,891,103, Cl. 214-75.00H.

Harris, John Derek; and Wood, Francis Roy, to Lucas Electrical Company Ltd., The. Magnetic poles. 3,891,881, Cl. 310-218.000.

Harris, Mark, to Brunswick Corporation. Capacitor discharge ignition testing apparatus. 3,891,917, Cl. 324-16.00R.

Harrison, Ian T.: *See—*
Fried, John H.; and Harrison, Ian T., 3,891,712.
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,891,766.

Harrison, Robert L. Ligature. 3,890,873, Cl. 84-383.000.

Harsch, Erich: *See—*
Reihle, Markus; and Harsch, Erich, 3,890,863.

Hart, Graham Arthur Nigel: *See—*
Ackroyd, John Morton; and Hart, Graham Arthur Nigel, 3,890,917.

Hart, Milburn L. System for controlling the deposition of a coating material onto a pipe or the like. 3,891,368, Cl. 425-114.000.

Hartman, Carl C. Semi-automatic packing of packages. 3,890,764, Cl. 53-61.000.

Harvey, Louis A. Carrier-attached expansible container holder. 3,891,174, Cl. 248-313.000.

Hasegawa, Eiichi: *See—*
Tsuji, Nobuo; and Hasegawa, Eiichi, 3,891,441.

Hatch, Donald. Vernier indicator. 3,890,716, Cl. 33-1.00D.

Hatta, Akihiro, to Tenchi Kikai Kabushiki Kaisha. Packing and aligning devices for pieces of candy. 3,890,766, Cl. 53-234.000.

Hauck, Frederic Peter; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Antianginal aryldecahydropyrrolo[3,4-f]quinolines. 3,891,652, Cl. 260-288.00R.

Haun, Russell W. Device for setting grading lines. 3,890,717, Cl. 33-86.000.

Haurat, Edouard; and Bouclet, Roland, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Dummy, in particular for vehicle or vehicle accessory tests. 3,890,723, Cl. 35-17.000.

Hauri, Jacques: *See—*
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 3,891,807.

Hauser, Hans; and McGuire, Robert D., to J. B. Foote Foundry Co., The. Transmission with draw-key type shift. 3,890,850, Cl. 74-372.000.

Hauser, Raimund: *See—*
Muszumanski, Trude; Kurz, Gunter; and Wendisch, Irngard, 3,891,304.

Hawkins, Edwin George Edward, to BP Chemicals (U.K.) Limited. Peroxy compounds and processes for their preparation. 3,891,663, Cl. 260-307.00F.

Hawkins, Joseph D., to Liconix. Acoustooptic modulator. 3,891,308, Cl. 350-161.000.

Hawley, William L.; and Lewis, Terence E., to GTE International Incorporated. Traffic signal hanger. 3,891,175, Cl. 248-317.000.

Hayashi, Naotake. Headphone. 3,891,810, Cl. 179-156.00R.

Hazemeijer B.V.: *See—*
Clason, Jan Christiaan, 3,891,896.

Hebert, Francois: *See—*
Filaferro, Rene; and Hebert, Francois, 3,891,927.

Hecht, Gert; Schoning, Rudolf; and Pieper, Wolfgang, to Siemens Aktiengesellschaft. Cooling arrangement for a motor driven compressor. 3,891,355, Cl. 417-371.000.

Heck, Dennis A.: *See—*
Herr, Kurt F.; Heck, Dennis A.; Lesny, Lucian J.; and Ward, Ronald L., 3,891,838.

Hed, A. Z.: *See—*
Harada, Yoshiro; and Hed, A. Z., 3,891,461.

Hedler, Robert A.: *See—*
Gallaro, Anthony V.; and Hedler, Robert A., 3,891,440.

Heil, Eduard; Kuchner, Karl; Sliwka, Wolfgang; and Smits, Harald, to BASF Aktiengesellschaft. Removing heat of reaction in copolymerization of ethylene in aqueous dispersion. 3,891,603, Cl. 260-63.00R.

Heine, Hans-Georg: *See—*
Rudolph, Hans; Heine, Hans-Georg; Fuhr, Karl; and Schnell, Hermann, 3,891,524.

Heinrich Frings, Firma: *See—*
Ebner, Heinrich; and Enenkel, Anton, 3,891,729.

Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 3,891,710.

Heinzer, Paul: *See—*
Jeanmaire, Peter; and Heinzer, Paul, 3,890,928.

Heller, Jurgen: *See—*
Wimmer, Gunter; Wilisch, Jurgen; and Heller, Jurgen, 3,891,222.

Heller, Rudolf, to Contraves AG. Adjustable support or stand for an optical observation instrument. 3,891,301, Cl. 350-85.000.

Hellfritzsch, Alvin G.: *See—*
Erickson, Porter W.; and Hellfritzsch, Alvin G., 3,891,466.

Helliwell, Merle M. Exerciser device. 3,891,207, Cl. 272-58.000.

Helmberger, Josef: *See—*
Deml, Reinhold; Greis, Ulrich; Bestenreiner, Friedrich; and Helmberger, Josef, 3,891,975.

Henderson, Henri H.: *See—*
Paulson, Peter C.; Henderson, Henri H.; and Worstell, Richard L., 3,891,515.

Hennells, Ransom J., to Compactor Company, Inc. Waste compactor with clamshell bag support. 3,890,890, Cl. 100-48.000.

Henniger, Peter Wolfgang; and Smid, Peter Max, to Koninklijke Nederlandsche Gist-en Spiritusfabrieken N.V. 7-[3-(Phenyl)-isoxazol-5-yl]acetamido-cephalosporanic acids. 3,891,635, Cl. 260-243.00C.

Henriquez, Theodore A.; and Tims, Allan C., to United States of America, Navy. Pressure release hemispherical piezoelectric type transducer. 3,891,871, Cl. 310-9.100.

Henze, Michael, to Allmanna Svenska Elektriska Aktiebolaget. Force or tension measuring means. 3,890,834, Cl. 73-144.000.

Herbenar, Edward J., to TRW Inc. Ball joint and method of manufacture thereof. 3,891,336, Cl. 403-320.000.

Herbert, Curtis B., Jr., to Exxon Production Research Company. Coded radio shooting unit. 3,891,963, Cl. 340-15.5TS.

Herbert Kannegiesser Kommanditgesellschaft: *See—*
Knappe, Heinrich; Notle, Karl Heinz; and Kempelmann, Reinhold, 3,891,129.

Herbots, Joseph Antoine: *See—*
Van Paesschen, August Jean; and Herbots, Joseph Antoine, 3,891,444.

Hercules Incorporated: *See—*
Desmarais, Armand J., 3,891,582.

Herculite Protective Fabrics Corporation: *See—*
Conklin, Christine, 3,891,786.

Hermann Berstorff Maschinenbau GmbH: *See—*
Gersbeck, Rolf; Greten, Berndt; and Steininger, Hans-Peter, 3,891,376.

Hermann, Joachim, to Bolkow Gesellschaft mit beschrankter Haftung. Optical position determining device for controlling a spin stabilized flying body. 3,891,161, Cl. 244-3.120.

Herr, john A.; and Jaffe, Wolfgang, to Singer Company, The. Permanent magnet electric motor having a non-ferrous solid armature. 3,891,876, Cl. 310-43.000.

Herr, Kurt F.; Heck, Dennis A.; Lesny, Lucian J.; and Ward, Ronald L., to GTE Automatic Electric Laboratories Incorporated. System of testing lines of a communication switching system. 3,891,838, Cl. 235-153.0AK.

Herreshoff, L. Francis, deceased; and by Vaughn, Muriel D., executrix, to Stinnes, Margarete L. Anchor. 3,890,915, Cl. 114-207.000.

Herring, Joe S.: *See—*
Eagleton, Harold N.; Lormand, Jerome D.; and Herring, Joe S., 3,890,693.

Herrmann, Albert: *See—*
Kleen, Gerhard; and Herrmann, Albert, 3,891,863.

Hertrick, Thomas P.; Mitiska, James L.; and Tobacman, Leo. Duplex valve. 3,891,164, Cl. 244-134.00A.

Hertz, Walter; Mentel, Jurgen; and Stroh, Jan, to Siemens Aktiengesellschaft. Apparatus for arc quenching. 3,891,814, Cl. 200-148.00R.

Hesener, Walter. Question and answer educational game with an answer control device. 3,890,724, Cl. 35-48.00R.

Hess, Hans-Jurgen E.; and Nelson, Roger P., to Pfizer Inc. 11-Deoxoglycyrrhetinic acid amides useful as antiulcer agents. 3,891,750, Cl. 424-80.000.

Hester, Jackson B., Jr., to Upjohn Company, The. 6-Phenyl-s-triazolo[4,3-a][1,3,4]-benzotriazepines and their preparation. 3,891,666, Cl. 260-308.00B.

Hettich, Alfred: *See—*
Stroezel, Reinhold; Hettich, Alfred; and Civarella, Alfredo, 3,891,049.

Hewlett-Packard Company: *See—*
Egan, Gary L., 3,891,972.
Miller, Arthur O., 3,891,811.

Heyes, Alan: *See—*
Carpenter, Roland Paul; Cowie, William Pirie; Heyes, Alan; and Sutton, Anthony Hubert, 3,891,776.

Hicks, William Robert, to General Electric Company. Appliance accessory attachment means. 3,890,985, Cl. 132-9.000.

Hideo, Hirokawa; and Yoshiaki, Mizuki, to Bell & Howell Company. Macro focusing device for variable focal length lens. 3,891,310, Cl. 350-187.000.

Hiele, Adrianus Leonardus, to U.S. Philips Corporation. Printed circuit board for a switching network. 3,891,815, Cl. 200-175.000.

Higuchi, Masaru; and Ohnaka, Kouichi, to Daicel, Ltd. Polyoxyalkylene amines. 3,891,709, Cl. 260-584.00B.

Higuchi, Takeru, to Alza Corporation. Anaesthetic topical and percutaneous administration with selected promoters. 3,891,757, Cl. 424-310.000.

Hilgartner, Carol H.; and Hilgartner, Stephen H. Decoding crossword-type game. 3,891,218, Cl. 273-130.00E.

Hilgartner, Stephen H.: *See—*
Hilgartner, Carol H.; and Hilgartner, Stephen H., 3,891,218.

Hill, George R.: *See—*
Needham, Donald G.; and Hill, George R., 3,891,597.

Hill, Johnnie P. Portable kit for assembling golf club. 3,891,212, Cl. 273-80.100.

Hilti Aktiengesellschaft: *See—*
Maier, Elmar; Tilg, Robert; and Walser, Karl, 3,891,133.

Hinds, Walter E.: *See—*
Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, 3,890,865.

Hinshaw, William B., Jr.: *See—*
Diana, Guy D.; and Hinshaw, William B., Jr., 3,891,674.

Hioki Electric Works Co., Ltd.: *See—*
Sakaguchi, Takehiko, 3,891,923.

Hirashima, Yasumasa: *See—*
Abe, Toshizo; Sakamoto, Seiho; Go, Shigeo; Maekuma, Koichi; Yamada, Yoshitaka; and Hirashima, Yasumasa, 3,891,611.

Hirata, Nobuhiro: *See—*
Ninomiya, Tomokazu; and Hirata, Nobuhiro, 3,891,374.

Hirokane, Tadashi: *See—*
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,891,517.

Hirvela, Robert J.; and Bolin, Robert A., to Rockwell International Corporation. Serial data multiplexing apparatus. 3,891,971, Cl. 340-172.500.

Hisamatsu, Hiroyoshi; Takahashi, Katutoshi; and Takase, Masanori, to Dainippon Ink & Chemicals Inc. Photopolymerizable, isocyanate-containing prepolymers. 3,891,523, Cl. 204-159.150.

Hitachi, Ltd.: *See—*
Fujimoto, Ryoichi; Takasugi, Kazuo; Inose, Fumiyuki; Maio, Kenji; and Yokozawa, Norio, 3,890,798.
Hanazono, Masanobu; Asai, Osamu; and Kawakami, Kanji, 3,891,995.
Inose, Fumiyuki; Suzuki, Takaji; and Kohno, Hideki, 3,890,826.
Ito, Katsuhiko; and Tsuchimoto, Takashi, 3,891,468.
Maki, Naoki, 3,890,906.
Mitomo, Isamu; Kaji, Tetsunori; and Fukushima, Masakazu, 3,891,306.
Moriyama, Hideki; and Tachi, Seiichi, 3,891,469.
Nakae, Hideo; and Goto, Akihiro, 3,891,432.
Okuhara, Shinzi; Kusano, Masaaki; and Kawanami, Mitsuru, 3,891,866.
Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, 3,891,100.
Tomita, Sadami; Chiba, Akio; and Miyajima, Goh, 3,891,475.
Tsunoda, Yoshito, 3,891,300.
Watanabe, Atsumi, 3,891,912.
Yasuda, Isao; and Osawa, Akira, 3,891,890.

Hobart Corporation: *See—*
Davis, Kenneth E., 3,890,825.

Hochland, Reich, Summer & Co.: *See—*
Fessler, Andreas; and Fessler, Ewald, 3,890,886.

Hock, Fromund, to Ernst Leitz GmbH. Optical method and apparatus for measuring the relative displacement of a diffraction grid. 3,891,321, Cl. 356-111.000.

Hock, Fromund, to Ernst Leitz GmbH. Method of locating the plane of sharp focussing of an image and apparatus therefore. 3,891,322, Cl. 356-126.000.

Hoda, Masahiro: *See—*
Kotone, Akira; Hoda, Masahiro; and Hori, Takeshi, 3,891,470.

Hodge, Edward B.; and Riddick, John A., to Commercial Solvents Corporation. Recovery of bacitracin as the calcium or magnesium complex of an alkylbenzenesulfonic acid. 3,891,615, Cl. 260-112.500.

Hoechst Aktiengesellschaft: *See—*
Benninger, Siegfried; and Rebsdat, Siegfried, 3,891,625.

Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 3,891,660.

Hoey, Charles E., to Rohm and Haas Company. Decorative laminate. 3,891,487, Cl. 156-78.000.

Hoff, John K.; and Goss, John B., to AG International. Drip irrigation device. 3,891,150, Cl. 239-272.000.

Hoffmann-La Roche Inc.: *See—*
Schocher, Arno Johannes; and Wiss, Oswald, 3,891,504.

Hofmann, Georg: *See—*
Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 3,891,730.

Hoggan, Donald; Wright, Ernest Walter; and Day, Ian, to Industrial Engineering Limited. Plate bending machines. 3,890,820, Cl. 72-169.000.

Hohman, Alvin E.; and Lively, Gerald W., to United States of America, Air Force. Surface treatment of titanium and titanium alloys. 3,891,456, Cl. 134-3.000.

Holder, James F.: *See—*
Smith, Owen; and Holder, James F., 3,891,394.

Holladay, Jimmie L., to Coats Company, Inc., The. Tire changing apparatus. 3,891,019, Cl. 157-1.240.

Holladay, John H.: *See—*
Shackelford, Albert D.; Holladay, John H.; and Lloyd, E. J., 3,891,097.

Holmes, Terry M.: *See—*
Lamer, Gerald P.; and Holmes, Terry M., 3,890,757.

Holtkamp, Calvin J., to White-Westinghouse Corporation. Reference correctable temperature control. 3,891,957, Cl. 337-347.000.

Homkes, Robert J.: *See—*
United States of America, National Aeronautics and Space Administration; Hunt, Stacy R., Jr.; Homkes, Robert J.; Poteate, Wilmer B.; and Sturgis, Andrew C., 3,891,311.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Date, Tasuku; and Yagi, Shizuo, 3,890,942.

Honeywell, Inc.: *See—*
Bennett, David B.; and Harman, Charles P., 3,891,939.
Bonne, Ulrich, 3,891,309.
Fulkerson, David E., 3,891,480.
Lane, Charles E., III, 3,890,702.

Honeywell Information Systems Inc.: *See—*
Coulter, Brent W.; and Migdalek, Laurence F., 3,891,974.

Hooker Chemicals & Plastics Corporation: *See—*
Marciniak, Harry W.; Carlson, Richard D.; and Dever, James L., 3,891,599.
Maul, James J.; and Carlson, Richard D., 3,891,600.

Hooper, Ira: *See—*
Berman, Herbert M.; and Hooper, Ira, 3,890,750.

Hoover, John R. E.: *See—*
Dunn, George L.; and Hoover, John R. E., 3,891,634.

Hopper, Richard A., to McDonnell Douglas Corporation. Fluid line coupling. 3,891,246, Cl. 285-110.000.

Horeschi, Giancarlo: *See—*
Barozzi, Gian Piero; and Horeschi, Giancarlo, 3,891,142.

Hori, Takeshi: *See—*
Kotone, Akira; Hoda, Masahiro; and Hori, Takeshi, 3,891,470.

Horioka, Masaki, to Nippon Kokan Kabushiki Kaisha. Method of fixing members with bolts. 3,890,697, Cl. 29-526.000.

Horodecka, Maria Teresa: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.

Horstmann, Aloys, to Hamel G.m.b.H, Zwirnmaschinen. Apparatus for waxing a thread. 3,890,924, Cl. 118-78.000.

Horton, William E., III, to Westinghouse Electric Corporation. Electrical inductive apparatus. 3,891,955, Cl. 336-205.000.

Houdaille Industries, Inc.: *See—*
Kumagai, Tom T.; Leone, William C.; May, Michael; Shoemaker, Harold L.; and Howard, Roy A., 3,891,910.

Houilleres du Bassin du Nord et du Pasde-Calais: *See—*
Chauvin, Raymond, 3,891,734.

House, William James, to AMP Incorporated. Solid state control circuit for vending devices. 3,891,075, Cl. 194-9.00R.

Hovercraft Development Limited: *See—*
Rapson, John Edward, 3,891,047.

Hovis, James E.; Johns, James E.; and Finke, Harry P., to Bloom Engineering Company, Inc. Stove burner. 3,891,384, Cl. 432-217.000.

Howard, Jack E., to International Fabric Molders, Inc. Apparatus for fabric molding. 3,891,377, Cl. 425-383.000.

Howard, Roy A.: *See—*
Kumagai, Tom T.; Leone, William C.; May, Michael; Shoemaker, Harold L.; and Howard, Roy A., 3,891,910.

Hoxtersche Gummifadenfabrik Emil Arntz K.G.: *See—*
Muller, Alexander, 3,891,364.

Hrovat, Milan: *See—*
Hackstein, Karl-Gerhard; and Hrovat, Milan, 3,891,502.

Huber, Walter E., to Dayco Corporation. Apparatus for making an endless power transmission belt. 3,891,405, Cl. 51-105.00R.

Huebner, Karl Heinz. Display card for knives and the like. 3,891,088, Cl. 206-349.000.

Hughes Aircraft Company: *See—*
Chester, Arthur N., 3,891,560.
Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, 3,890,865.

Hughes, James W., to Texaco Inc. Epoxy scale-resistant coating. 3,891,602, Cl. 260-47.0EN.

Hukuda, Yositugu: *See—*
Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, 3,891,503.

Hulme, Jack R.: *See—*
Frizzell, Joseph G.; and Hulme, Jack R., 3,890,837.

Huml, James O.: *See—*
Layne, Gilbert S.; and Huml, James O., 3,891,690.

Humphreys, Ira B. Helical chute concentrator and method of concentrating. 3,891,546, Cl. 209-211.000.

Humphries, William H., to Raychem Corporation. Welded polymeric articles and process. 3,891,490, Cl. 156-295.000.

Hunt, Stacy R., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; Hunt, Stacy R., Jr.; Homkes, Robert J.; Poteate, Wilmer B.; and Sturgis, Andrew C., 3,891,311.

Hunter, Charles A., II; Pech, David J.; and Morrow, James G., Sr., to Manitowoc Company, Inc., The. Selectively positionable operator's cab. 3,891,264, Cl. 296-28.00C.

Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Apparatus for treating tire cord fabric. 3,890,927, Cl. 118-419.000.

Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Mechanism for detecting trapped cords on a creel. 3,891,156, Cl. 242-54.00R.

Hunter, Edward E., to Goodyear Tire & Rubber Company, The. Pricker roll. 3,891,494, Cl. 156-437.000.

Hunter, Edward W., to Emco Limited. Manhole cover lock. 3,891,119, Cl. 220-324.000.

Huntington Industries Incorporated: *See—*
Ullman, John E., 3,890,763.

Hunziker, Fritz: *See—*
Schmutz, Jean; Hunziker, Fritz; and Kunzle, Franz Martin, 3,891,647.

Hura, Michael, to Picker Corporation. Method and apparatus for unloading cassettes. 3,891,854, Cl. 250-468.000.

Hurlemann, Ernst; and Zellweger, Jurg, to Werkzeugmaschinenfabrik Oerlikon Buhrle & Co. Automatic firing weapon. 3,890,881, Cl. 89-176.000.

Hurst, John, to W. R. Grace & Company. Method of sealing shuttering against a deformable section of an external waterstop for use in forming joints in concrete. 3,891,732, Cl. 264-34.000.

Hurst, John F.: *See—*
Laub, Joseph L.; and Hurst, John F., 3,891,822.

Hurst, Kurt, to Robert Bosch G.m.b.H. Recording apparatus with improved counterelectrode. 3,891,991, Cl. 346-74.00E.

Hurtmanns, Heinz: *See—*
Decker, Hanns; Hurtmanns, Heinz; and Stockmann, Helmut, 3,891,153.

Hushower, Richard R.: *See—*
Duttarer, Ralph M.; and Hushower, Richard R., 3,891,003.

Husqvarna Vapenfabriks AB: *See—*
Valtersson, Bo Valtersson, 3,891,818.

Hussain, Anwar A.: *See—*
Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., 3,891,696.

Hutarew, Georg, to J. M. Voith GmbH. Pumped storage power plant. 3,891,860, Cl. 290-52.00X.

Hutchison, Arthur H.: *See—*
Pierce, Oscar L.; Hutchison, Arthur H.; King, Olin B.; and McMillian, Lonnie S., 3,890,968.

Huyck Corporation: *See—*
Fekete, Eugene Zoltan; and Grady, Raymond J., 3,890,681.

Hyggen, Egil, to Elkem-Spigerverket A/S. Gripping shoes for vehicle wheels. 3,891,018, Cl. 152-225.000.

I. S. F. S.p.A.: *See—*
Pifferi, Giorgio, 3,891,641.

ICI Australia Limited: *See—*
Battaerd, Hendrik Adrian Jacobus; Bolto, Brian Alfred; and Shah, Pir Ghulam Samadani, 3,891,576.

Ideal Toy Corporation: *See—*
Cooper, Julius; and Reinertsen, Tormod K., 3,891,213.
Ensmann, Burt; Ieda, Michael; and Joshi, Madhusdan, 3,891,216.

Ieda, Michael: *See—*
Ensmann, Burt; Ieda, Michael; and Joshi, Madhusdan, 3,891,216.

Iijima, Katsuhiko; and Yoshida, Katsuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Movable frame fixing device. 3,891,065, Cl. 188-41.000.

Ikegai Tekko Kabushiki Kaisha: *See—*
Takiura, Mamoru, 3,891,372.

Imperial Chemical Industries Limited: *See—*
Birchall, James Derek, 3,891,595.
Moody, Anthony Gifford; and Osmond, Desmond Wilfrid John, 3,891,572.
Smith, Trevor James, 3,891,645.
Voaden, Arthur Trevor, 3,891,736.
Waddan, Dhafir Yusuf, 3,891,707.

Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, to Sumitomo Chemical Co., Ltd. Fused quinazolinones. 3,891,638, Cl. 260-244.00R.

Inaba, Yoshihito: *See—*
Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, 3,891,570.

Inagaki, Takeo: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhirc and Nagayama, Masuzo, 3,891,683.

Industrial Engineering Limited: *See—*
Hoggan, Donald; Wright, Ernest Walter; and Day, Ian, 3,890,820.

Information Storage Systems, Inc.: *See—*
Cloke, Robert L., 3,891,840.

Ing. C. Olivetti & C., S.p.A.: *See—*
Signora, Maurizio, 3,891,367.
Torresi, Vincenzo N., 3,891,981.

Inland Container Corporation: *See—*
Ellison, Donald E.; and Davenport, Larry C., 3,891,137.

Inose, Fumiyuki; Suzuki, Takaji; and Kohno, Hideki, to Hitachi, Ltd. Intoxicated driver capability tester. 3,890,826, Cl. 73-27.00R.

Inose, Fumiyuki: *See—*
Fujimoto, Ryoichi; Takasugi, Kazuo; Inose, Fumiyuki; Maio, Kenji; and Yokozawa, Norio, 3,890,798.

Inoue, Kazuhiko: *See—*
Kasugai, Hiroshi; Motojima, Shozo; and Inoue, Kazuhiko, 3,891,756.

Institut Merieux: *See—*
Pilet, Charles; and Bonneau, Marc, 3,891,751.

Institute of Gas Technology: *See—*
Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,403.
Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,404.

Instituttet for Produktudvikling: *See—*
Trostmann, Erik; and Fensvig, Jens Andreas Toft, 3,890,839.

Instytut Przemyslu Farmaceutycznego: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.
Intel Corporation: *See—*
Vadasz, Leslie L., 3,891,190.
Intellectual Property Development Corporation: *See—*
Saltzman, William H., 3,891,681.
Interlake, Inc.: *See—*
Coleman, Bestor P.; and McConnell, Kennedy, 3,891,073.
Intermountain Research and Development Corporation: *See—*
Weeks, Lorne E.; and Doran, Ronald W., 3,891,393.
International Business Machines Corporation: *See—*
Gueret, Pierre Leopold, 3,891,864.
International Fabric Molders, Inc.: *See—*
Howard, Jack E., 3,891,377.
International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 3,891,710.
Vinals, Joaquin Francisco; Quinn, Alton Dewitt; and Pittet, Alan Owen, 3,890,981.
International Standard Electric Corporation: *See—*
Charransol, Pierre; Hauri, Jacques; and Athenes, Claude, 3,891,807.
Chatelon, Andre Edouard Joseph; and Coudray, Andre Lucien, 3,891,806.
Van Brussell, Marcel A.; and Julia-Polle, Raymond Louis, 3,891,808.
INTERx Research Corporation: *See—*
Bodor, Nicolae S.; and Kaminski, James J., 3,891,649.
Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., 3,891,696.
Intreprinderea Mecanica de Utilaje Medcidia: *See—*
Radu, Stefan I., 3,890,823.
Investments and Innovative Concepts, Inc.: *See—*
Petersilie, Frank W., 3,890,658.
Ipos Gesellschaft fur Integrierte Prothesenentwicklung und Orthopadietechnischen Service m.b.H. & Co. K.G.: *See—*
Prahl, Jan, 3,890,650.
Irwin, James; and Erikson, J. Alden, to PPG Industries, Inc. Method of electro-depositing compositions containing hydrolyzed polyepoxides. 3,891,525, Cl. 204-181.000.
Irwin, Malcolm F., to Pro-Tech Inc. Liquid sampling. 3,890,843, Cl. 73-421.00B.
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, to Lion Fat & Oil Co., Ltd. Process for manufacturing polyol esters of carboxylic acids. 3,891,683, Cl. 260-410.600.
Isaac, Eirlys R.; and Kirby, Peter, to Shell Oil Company. Dioxolanyl carbonyl ureas and thioureas. 3,891,675, Cl. 260-340.900.
Isaacs, Jack L., to General Electric Company. Composite package. 3,891,086, Cl. 206-320.000.
Isaacs, Jack L.: *See—*
Bricker, Francis G.; Isaacs, Jack L.; and Nobbs, Douglas C., 3,891,170.
Ishida, Kengo: *See—*
Sato, Takaaki; and Ishida, Kengo, 3,891,770.
Ishige, Ryouhei: *See—*
Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, 3,891,100.
Ishiguro, Toshihiro: *See—*
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; Maeda, Kihachiro; and Ishiguro, Toshihiro, 3,891,763.
Ishikawa, Norikatsu: *See—*
Goto, Kenji; and Ishikawa, Norikatsu, 3,890,945.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Toshihiro, 3,891,383.
Ishikawajima-Harima Jukogyo Kubushiki: *See—*
Takenouchi, Senji; Yanai, Tautomu; Matsumoto, Takamasa; and Ohtani, Hiroyoshi, 3,891,051.
Ishizumi, Kikuo: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 3,891,638.
Ishman, Neal H.; Lenert, Richard W.; and Goldman, Jeffrey B., to American Standard, Inc. Filter module. 3,891,926, Cl. 325-159.000.
Iskra, Marian. Combination screw and screwdriver with axial guide spigot. 3,891,017, Cl. 145-50.00A.
Isobe, Yasuo: *See—*
Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.
Itaya, Toshihisa: *See—*
Suzuki, Yasushi; Itaya, Toshihisa; Minami, Nobuyoshi; Tarutani, Masaaki; Miki, Tokutaro; and Miyasaka, Katsuhiko, 3,891,664.
Ito, Hisakatu: *See—*
Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,891,506.
Ito, Katsuhiko; and Tsuchimoto, Takashi, to Hitachi, Ltd. Method of manufacturing semiconductor device. 3,891,468, Cl. 148-1.500.
Ito, Tadashi: *See—*
Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.
Ito, Yoshio, to Canon Kabushiki Kaisha. Corona discharger cleaning apparatus. 3,891,846, Cl. 250-324.000.
Itoh, Fumio: *See—*
Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.
ITT Industries, Inc.: *See—*
Jones, Allan F., 3,891,293.
Iwasaki Tsushinki Kabushiki Kaisha: *See—*
Sekiguchi, Kouichi, 3,891,940.
Izumiya, Nobuo: *See—*
Sakakibara, Kyoichi; Gondoh, Masaaki; Shimazawa, Eiichirou; and Izumiya, Nobuo, 3,891,614.
J. B. Foote Foundry Co., The: *See—*
Hauser, Hans; and McGuire, Robert D., 3,890,850.
J. I. Case Company: *See—*
Lamer, Gerald P.; and Holmes, Terry M., 3,890,757.
Symmank, William D., 3,891,095.
J. M. Voith GmbH: *See—*
Hutarew, Georg, 3,891,860.
J. P. Stevens and Co., Inc.: *See—*
Latta, Bruce M.; and Willard, John J., Jr., 3,891,387.
Jackson, Paul L., to Ford Motor Company. Determination of oxygen in molten steel. 3,891,512, Cl. 204-1.00T.
Jackson, Robert F.: *See—*
Froberg, Magnus L.; and Jackson, Robert F., 3,891,422.
Jacobs, Marcellus L.; and Jacobs, Paul R. Clutch-controlled, wind-operated, power producing propeller. 3,891,347, Cl. 416-32.000.
Jacobs, Paul R.: *See—*
Jacobs, Marcellus L.; and Jacobs, Paul R., 3,891,347.
Jaeger, Charles G. Dental dowel pin positioning and aligning apparatus. 3,890,710, Cl. 32-11.000.
Jaffe, Wolfgang: *See—*
Herr, john A.; and Jaffe, Wolfgang, 3,891,876.
Jakszt, Werner, to Siemens Aktiengesellschaft. Voltage overload arrester for high-voltage switching systems. 3,891,897, Cl. 317-62.000.
Jandura, John J., Jr. Process and apparatus for the removal of arrows. 3,890,692, Cl. 29-427.000.
Janssen, Peter Johannes Hubertus; van Hattum, Johannes Simon Albert; and Korver, Jan Abraham Cornelis, to U.S. Philips Corporation. Line time base in a television receiver. 3,891,800, Cl. 178-69.5TV.
Janusonis, Gaile A., to Eastman Kodak Company. Sensitizing solid silver halide emulsion layer with hot hydrogen. 3,891,446, Cl. 96-107.000.
Japan Storage Battery Co., Ltd.: *See—*
Muto, Eiji; Kawarabayashi, Tsuneo; Matsumura, Koichi; and Tamura, Hitoshi, 3,891,465.
Japan Synthetic Rubber Co., Limited: *See—*
Yaeda, Yasuyuki; Chikatsu, Yoshishige; Ando, Noriaki; and Sakata, Ryuichi, 3,891,724.
Japanese National Railways: *See—*
Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, 3,891,100.
Jayant, Nuggehally Sampath: *See—*
Flanagan, James Loton; and Jayant, Nuggehally Sampath, 3,891,805.
Jeanmaire, Peter; and Heinzer, Paul, to Wifo Wissenschaftliches Forschungs-Institut A.G. Magnetic brush for use in developing electrophotographic images. 3,890,928, Cl. 118-637.000.
Jeffers, Carl H. Push broom handle clamp. 3,891,339, Cl. 403-192.000.
Jefferson Chemical Company, Inc.: *See—*
Yeakey, Ernest Leon; and Moss, Philip Hotchkiss, 3,891,742.
Jelmorini, Gerardus: *See—*
Essers, Wilhelmus Gerardus; and Jelmorini, Gerardus, 3,891,824.
Jenkner, Herbert, to Chemische Fabrik Kalk GmbH. Process for the purification of crude terephthalic. 3,891,700, Cl. 260-525.000.
Jenko, Dragutin: *See—*
Scharfen, Hans; Schmitz, Karl Heinz; Strerath, Theo; and Jenko, Dragutin, 3,891,058.
Jenness, Raymond C., to Allis-Chalmers Corporation. Pivoted pad bearing apparatus and method for bidirectional rotation. 3,891,281, Cl. 308-1.00R.
Jennings Compound Bow, Inc.: *See—*
Jennings, Thomas Paul; Williamson, John Monroe; and Sumida, Carl, 3,890,951.
Jennings, Thomas Paul; Williamson, John Monroe; and Sumida, Carl, to Jennings Compound Bow, Inc. Adjustable arrow rest. 3,890,951, Cl. 124-41.000.
Jensen, Garold K., to United States of America, Navy. One-operation signal processor. 3,891,987, Cl. 343-5.00R.
Jensen, Gerald A.; and Parsonage, Harry N., to Mead Corporation, The. Electrolytic chemical reaction apparatus. 3,891,532, Cl. 204-260.000.
Jerrel, Raymond M. Support means for wheeled vehicles. 3,891,177, Cl. 248-352.000.
Joerns Furniture Company: *See—*
Peterson, Warren J., 3,890,907.
Johansen, Jorgen Skoubo. Ceiling or wall covering. 3,890,753, Cl. 52-500.000.
John Wyeth and Brother (Ltd.): *See—*
White, Alan Chapman, 3,891,644.
Johns, James E.: *See—*
Hovis, James E.; Johns, James E.; and Finke, Harry P., 3,891,384.
Johns-Manville Corporation: *See—*
Dave, Shashi Bhaishanker, 3,891,412.
Sadler, Thomas Harry, 3,891,498.
Terry, Rupert Douglas, 3,891,493.

Johnson, Jay. Roving cutter for fiber reinforced synthetic resin sprayers. 3,890,706, Cl. 30-180.000.

Johnson & Johnson: *See—*
Aspelin, Gary Bertil; Caffrey, Richard Francis; and Lauer, William, 3,890,966.

Johnson, Morris E.; and Princ, Josef, to Nichols-Homeshield, Inc. Self-retaining latch with insert strengthener. 3,891,256, Cl. 292-202.000.

Johnson, Quentin S.; and Pignone, Edward H. Automatic day-night television surveillance system. 3,891,795, Cl. 178-7.200.

Johnson, Robert F. Surfboard rudder-fin combination. 3,890,661, Cl. 9-310.00B.

Johnson, Waldo O.; and Buynak, Robert G., to Louisiana-Pacific Corporation. Double hung pivotal window. 3,890,741, Cl. 49-162.000.

Jolly, James G.: *See—*
Braxton, Henry G., Jr.; Griffing, Margaret E.; and Jolly, James G., 3,891,449.

Jones, Allan F., to ITT Industries, Inc. Flat cable terminating. 3,891,293, Cl. 339-97.00C.

Jones, Boyd C. Fish hook receptacle. 3,890,737, Cl. 43-57.50R.

Jones, Charles, to Curtiss-Wright Corporation. Air-cooled oil sump with fins for receiving oil in a heat exchange relationship. 3,891,059, Cl. 184-104.00B.

Jones, Henry M.: *See—*
Lance, James W.; and Jones, Henry M., 3,891,477.

Jones, Paul H., to National Rolling Mills Co. Main beam joint for suspended ceilings. 3,890,760, Cl. 52-758.00A.

Jones, Robert E.: *See—*
Gilbert, Eugene C.; Jones, Robert E.; and Sherman, Edward, 3,891,717.

Jons, Claus: *See—*
Dworak, Wilhelm; Jons, Claus; and Vlemmings, Jan, 3,891,360.

Joshi, Madhusdan: *See—*
Ensmann, Burt; Ieda, Michael; and Joshi, Madhusdan, 3,891,216.

Joullie, Maurice L.; Maillard, Gabriel; Lakah, Lucien; and Muller, Pierre, to Recherche Pharmaceutiques et Scientifiques. Digestive pharmaceutical composition comprising S-carboxymethyl cysteine for reducing viscosity of respiratory tract secretions, and method of treating therewith. 3,891,749, Cl. 424-311.000.

Joyce, Norman George, to Science Research Council. Electrically-conducting materials. 3,891,868, Cl. 310-5.000.

Julia-Polle, Raymond Louis: *See—*
Van Brussell, Marcel. A.; and Julia-Polle, Raymond Louis, 3,891,808.

Jung, Friedrich, to Triumph Werke Nurnberg A.G. Ribbon shifting arrangement. 3,891,078, Cl. 197-156.000.

Jung, Herbert A., to Exxon Research and Engineering Company. Preparation of organometallic complexes. 3,891,684, Cl. 260-429.00R.

Justus, Edgar J., to Beloit Corporation. Slitting mechanism for winder. 3,891,157, Cl. 242-56.200.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Adachi, Kazuma; Tokunaga, Masayoshi; and Takeshita, Shigeru, 3,891,350.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Shoda, Hiroshi; and Araki, Mikio, 3,891,835.

Kadi-Ogly, Ibragim Akhmedovich: *See—*
Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; Kadi-Ogly, Ibragim Akhmedovich; and Tjurin, Jury Grigorievich, 3,891,877.

Kaij, Mats J.: *See—*
Mogensen, Palne; and Kaij, Mats J., 3,891,562.

Kaiser Aluminum & Chemical Corporation: *See—*
Robinson, Ivan B., 3,891,400.

Kaiser, Bernhard: *See—*
Wokock, Ortwin; and Kaiser, Bernhard, 3,891,076.

Kaiser, Leonhard: *See—*
Schmidt, Gunther; Theiss, Armin; Dederra, Carl-Helmut; and Kaiser, Leonhard, 3,890,781.

Kaiser, Reinhold, to Telefunken Patentverwertungsgesellschaft mbH. Method of producing a semiconductor device. 3,891,481, Cl. 148-188.000.

Kaji, Tetsunori: *See—*
Mitomo, Isamu; Kaji, Tetsunori; and Fukushima, Masakazu, 3,891,306.

Kali-Chemie AG.: *See—*
Musall, Reimar; and Wolsing, Wilhelm, 3,891,396.

Kali-Chemie Aktiengesellschaft: *See—*
Brautigam, Hans; Weidenbach, Gunter; and Koepernik, Karl Hermann, 3,891,575.

Kalopissis, Gregoire; Viout, Andre; and Vanlerberghe, Guy, to Societe Anonyne dite: L'Oreal. Hair softening dye compositions containing surface-active asparagine derivatives. 3,891,385, Cl. 8-10.100.

Kalter, Jan: *See—*
Smid, Peter Max; and Kalter, Jan, 3,891,628.

Kamino, Kimiyuki: *See—*
Yamada, Keiko; Kamino, Kimiyuki; and Kubota, Toshiro, 3,891,879.

Kaminski, James J.: *See—*
Bodor, Nicolae S.; and Kaminski, James J., 3,891,649.

Kan, Peter T.; and Cenker, Moses, to BASF Wyandotte Corporation. Carbodiimide-isocyanurate foams containing urethane linkages. 3,891,578, Cl. 260-2.5AC.

Kanaoka, Yuichi; and Machida, Minoru, to Yuichi Kanaoka. Thiol-group detecting fluorescence reagents. 3,891,669, Cl. 260-326.340.

Kanaoka, Yuichi; Machida, Mikiko; and Machida, Minoru, to Kanaoka, Yuichi. N-(1-anilino naphthyl-4) malemide thiol-group detecting reagent. 3,891,670, Cl. 260-326.5FM.

Kankaanpaa, Matti, to Valmet O. Y. Paper machine having a long transport wire for making tissue paper. 3,891,500, Cl. 162-274.000.

Kannapell, David H.; Schupp, Philipp P.; and Amrein, David, to American Air Filter Company, Inc. Expansion joint. 3,891,248, Cl. 285-156.000.

Kao Soap Co., Ltd.: *See—*
Matsuda, Kazuo; Tanaka, Yoshiaki; and Sakai, Takeyo, 3,891,715.

Kaplan, Arthur R. Device for measuring advertising space. 3,890,715, Cl. 33-1.00B.

Karl M. Reich Maschinenfabrik GmbH: *See—*
Gebhardt, Fritz, 3,890,861.

Karobath, Ernst; and Rippel, Leopold, to Telephon-und Telegraphen-Fabriks Aktiengesellschaft Kapsch & Sohne In Wien. Leak-proof galvanic cell. 3,891,463, Cl. 136-134.00R.

Karszes, William M., to General Electric Company. Ethylene-vinyl chloride emulsion coated plastic laminate. 3,891,788, Cl. 428-511.000.

Kasbo, Loyd G.: *See—*
Stanley, Leonard A.; and Kasbo, Loyd G., 3,891,423.

Kasugai, Hiroshi; Motojima, Shozo; and Inoue, Kazuhiko, to Mitsubishi Chemical Industries Ltd. Agricultural pesticide composition. 3,891,756, Cl. 424-177.000.

Katayama, Hajime; Miyamoto, Koichi; and Ohashi, Shoji, to Canon Kabushik. Kaisha. Developing liquid recovery device in a copying machine. 3,890,721, Cl. 34-73.000.

Kato, Kazue, to Platinum Pen Co., Ltd. Writing implement. 3,891,329, Cl. 401-65.000.

Kato, Teiji; and Okamoto, Katsumi, to Crown Zellerbach International, Inc. Synthetic papermaking pulp and process of manufacture. 3,891,499, Cl. 162-157.00R.

Kato, Tsutomu: *See—*
Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, 3,891,574.

Katsumoto, Kiyoshi; and Lind, Wilton H., to Chevron Research Company. Maleic anhydride recovery using nonaqueous medium. 3,891,680, Cl. 260-346.80M.

Katz, Leon; and Golda, Eugene, to Polychrome Corporation. Aqueous developing composition for lithographic diazo printing plates. 3,891,438, Cl. 96-49.000.

Katz, Leon; Rowe, William; and Golda, Eugene, to Polychrome Corporation. Aqueous developing composition for lithographic diazo printing plates. 3,891,439, Cl. 96-49.000.

Kaufman, Arnold S.; and Sweet, Albert, to Elsters, Inc. Exhaust hood. 3,890,887, Cl. 98-115.00K.

Kawada, Hirohito: *See—*
Suzuki, Tadao; and Kawada, Hirohito, 3,891,933.

Kawai, Masanori: *See—*
Kimura, Yoshiaki; Kawai, Masanori; Yajima, Tatsuc, and Morishita, Taneji, 3,891,320.

Kawai, Taneichi; and Nishida, Koji, to Aisin Seiki Kabushiki Kaisha. Automatic fishing apparatus. 3,890,734, Cl. 43-4.000.

Kawakami, Kanji: *See—*
Hanazono, Masanobu; Asai, Osamu; and Kawakami, Kanji, 3,891,995.

Kawamoto, Junji: *See—*
Sawada, Hideo; and Kawamoto, Junji, 3,890,983.

Kawana, Yoshio: *See—*
Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, 3,891,574.

Kawanami, Mitsuru: *See—*
Okuhara, Shinzi; Kusano, Masaaki; and Kawanami, Mitsuru, 3,891,866.

Kawarabayashi, Tsuneo: *See—*
Muto, Eiji; Kawarabayashi, Tsuneo; Matsumura, Koichi; and Tamura, Hitoshi, 3,891,465.

Keenan, John Gregory; Chilman, John Alfred; and Brooking, Ivor Harold, to Dowty Rotol Limited. Fans. 3,891,346, Cl. 415-129.000.

Keith, Marvin W., Jr., to Buehler Ltd. Polishing apparatus. 3,891,409, Cl. 51-361.000.

Kelpin, Thomas G. Aquatic harvester with improved flotation system. 3,890,771, Cl. 56-9.000.

Kelsey-Hayes Company: *See—*
Frait, John S., 3,891,279.

Kelsey, Paul S. Precast panels with corner-divider projections. 3,891,178, Cl. 249-91.000.

Kempelmann, Reinhold: *See—*
Knappe, Heinrich; Notle, Karl Heinz; and Kempelmann, Reinhold, 3,891,129.

Kempson, Kenneth William: *See—*
Lycett, Peter; and Kempson, Kenneth William, 3,891,112.

Kenaga, Eugene E., to Dow Chemical Company, The. Certain triaryl tin compounds as chemosterilants. 3,891,767, Cl. 424-288.000.

Kendall Co., The: *See—*
Stanley, Leonard A.; and Kasbo, Loyd G., 3,891,423.

Kernforschungsanlage Julich GmbH: *See—*
Brixy, Heinz, 3,890,841.

Kershaw, Robert William; Lubbock, Frederick John; and Polgar, Livia, to Balm Paints Limited. Process of preparing vesiculated polymers. 3,891,577, Cl. 260-2.50R.

Kerwin, Robert D.; and Sulzle, Darwin B., to United States of America, Air Force. Analog to digital conversion by subranging with multiple level redundant error correction. 3,891,984, Cl. 340-347.0CC.

Kestenbaum, Ami: *See—*
Dabby, Franklin Winston; and Kestenbaum, Ami, 3,891,302.

Kewley, James W.: *See—*
Prior, William C.; and Kewley, James W., 3,891,552.

Keys, Lloyd Kenneth: *See—*
Mikhael, Wasfy Boushra; and Keys, Lloyd Kenneth, 3,891,938.

Kienzle Apparate GmbH: *See—*
Wokock, Ortwin; and Kaiser, Bernhard, 3,891,076.

Kieras, Joseph A.: *See—*
Rosenthal, Rudolph; and Kieras, Joseph A., 3,891,748.

Kierstead, William L., to Electronized Chemicals Corporation. Splicing and repairing insulated electrical wire. 3,891,790, Cl. 174-93.000.

Kim, Chang-Kyo: *See—*
Opdahl, Everett W.; and Kim, Chang-Kyo, 3,890,919.

Kimura, Hisao, to Asahi Broadcasting Corporation. Television character crawl display method and apparatus. 3,891,792, Cl. 178-5.80R.

Kimura, Toshio: *See—*
Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, 3,891,503.

Kimura, Yoshiaki; Kawai, Masanori; Yajima, Tatsuo; and Morishita, Taneji, to Konishiroku Photo Industry Co., Ltd. Light interference gauge and flatness tester. 3,891,320, Cl. 356-109.000.

Kimura, Yoshio: *See—*
Sunahara, Hiroshi; and Kimura, Yoshio, 3,891,205.

King Engineering Corporation: *See—*
Wade, William D., 3,891,417.

King, Olin B.: *See—*
Pierce, Oscar L.; Hutchison, Arthur H.; King, Olin B.; and McMillian, Lonnie S., 3,890,968.

King Radio Corporation: *See—*
Rodgers, Daniel L.; and Cater, Thomas F., 3,891,832.

Kinnerud, Verner Elof Johannes; and Svensson, Bernt Oskar Gerhard, to Svenska Ackumulator Aktiebolaget Jungner. Electric accumulator with chiefly plane plates. 3,891,464, Cl. 136-145.000.

Kirby, Peter: *See—*
Isaac, Eirlys R.; and Kirby, Peter, 3,891,675.

Kircher, Melvin D. Collating machine. 3,891,202, Cl. 270-58.000.

Kirkpatrick, Burnard M.; and Moore, James C., to Teledyne Industries, Inc. Bore hole instrument package self-leveler. 3,891,050, Cl. 181-102.000.

Kiscaden, Roy W.: *See—*
Yannone, Robert A.; and Kiscaden, Roy W., 3,891,915.

Kiyonaga, Yasuhiro: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,891,683.

Klapdar, Wilhelm: *See—*
Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, 3,891,196.

Kleen, Gerhard; and Herrmann, Albert, to Siemens Aktiengesellschaft. Voltage transformer for a fluid insulated high-voltage multiconductor switching apparatus. 3,891,863, Cl. 307-147.000.

Klein, Laszlo: *See—*
Lea, Darrell Bernard; and Klein, Laszlo, 3,890,725.

Kleine, Jean Jacques, to S.T. Dupont. Process for storing a liquid for its distribution in the gaseous state. 3,891,147, Cl. 239-6.000.

Kleinewefers Industrie Companie GmbH: *See—*
Sonnen, Rudolf, 3,891,223.

Kleis, Derk, to U.S. Philips Corporation. Magnet system for an acoustic transducer. 3,891,809, Cl. 179-119.00R.

Klemm, Martin, to Fritz Buser AG. Maschinenfabrik. Method to prepare matrices to manufacture lattice or grid metal layers structures by electrolytic deposition. 3,891,514, Cl. 204-15.000.

Klever, Harold Howard, to du Pont de Nemours, E. I., and Company. Vulcanizable chlorinated elastomer composition. 3,891,725, Cl. 260-889.000.

Kleykamp, Donald L., to Dayco Corporation. Exteriorly corrugated hose of composite materials. 3,891,007, Cl. 138-121.000.

Kline, Harlan H.: *See—*
Bordner, Dalton W.; and Kline, Harlan H., 3,891,489.

Kline, Leo; and Sugihara, Takashi F., to United States of America, Agriculture. Culture of sour dough bacteria. 3,891,773, Cl. 426-61.000.

Klocker-Humboldt-Deutz, AG: *See—*
Decker, Hanns; Hurtmanns, Heinz; and Stockmann, Helmut, 3,891,153.

Knappe, Heinrich; Notle, Karl Heinz; and Kempelmann, Reinhold, to Herbert Kannegiesser Kommanditgesellschaft. Process for folding shirts or similar articles of clothing. 3,891,129, Cl. 223-37.000.

Knell, Bernhard: *See—*
Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, 3,891,025.

Knight, Houston W., to FMC Corporation. Bottom cross-over loading arm. 3,891,004, Cl. 137-615.000.

Kobari, Sadami: *See—*
Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, 3,891,570.

Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, to Agency of Industrial Science & Technology. Hollow spheres of activated carbon and method for manufacture thereof. 3,891,574, Cl. 252-421.000.

Kobayashi, Toshihiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rotary kiln apparatus with suspension preheater having burner for calcining. 3,891,383, Cl. 432-80.000.

Kobayashi, Tsuyoshi: *See—*
Okamoto, Tadashi; Kobayashi, Tsuyoshi; and Yamamoto, Hisao, 3,891,626.

Kobayashi, Yasunobu; and Ogawa, Hikaru, to Kobe Steel, Ltd. Meshes cutting machine. 3,890,864, Cl. 83-162.000.

Kobe Steel, Ltd.: *See—*
Kobayashi, Yasunobu; and Ogawa, Hikaru, 3,890,864.

Koch, Andrew T. Apparatus for inverting containers. 3,891,098, Cl. 214-8.50H.

Kodis, Robert D., to Di/An Controls, Inc. Multiple sheet ticket printer. 3,890,893, Cl. 101-69.000.

Koepernik, Karl Hermann: *See—*
Brautigam, Hans; Weidenbach, Gunter; and Koepernik, Karl Hermann, 3,891,575.

Kogon, Irving Charles, to du Pont de Nemours, E. I., and Company. Curing with complexes of selected diamines and alkali metal salts. 3,891,606, Cl. 260-77.5AM.

Kohara, Haruki, to Nippon Electric Company, Limited. Magnetic domain propagating circuit. 3,891,978, Cl. 340-174.0TF.

Kohn, Gustave K., special administrator: *See—*
Brown, Melancthon S., deceased; and Kohn, Gustave K., special administrator, 3,891,424.

Kohno, Hideki: *See—*
Inose, Fumiyuki; Suzuki, Takaji; and Kohno, Hideki, 3,890,826.

Koivunen, Erkki A., to General Motors Corporation. Distributor drive arrangement for a rotary combustion. 3,890,937, Cl. 123-8.450.

Kolibas, James Andrew, to Addressograph-Multigraph Corporation. Electrophotographic reproduction apparatus. 3,891,315, Cl. 355-8.000.

Kollmorgen Corporation: *See—*
Walker, Richard A., 3,891,317.

Kollonitsch, Janos; Scott, Alan N.; and Doldouras, George A., to Merck & Co., Inc. Synthesis of 1-substituted-2-(p-fluorophenyl)-5-nitroimidazoles. 3,891,668, Cl. 260-309.000.

Kombinat Za Zvetni Metali "Dimiter Blagoev": *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.

Kommanditbolaget United Stirling AB & Co.: *See—*
Torsten, Bo Goran, 3,890,785.

Komnatny, Igor Pavlovich: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.

Koninklijke Nederlandsche Gist-en Spiritusfabrieken N.V.: *See—*
Henniger, Peter Wolfgang; and Smid, Peter Max, 3,891,635.
Smid, Peter Max; and Kalter, Jan, 3,891,628.

Konishi, Iseo. Transformer. 3,891,954, Cl. 336-61.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Kimura, Yoshiaki; Kawai, Masanori; Yajima, Tatsuo; and Morishita, Taneji, 3,891,320.

Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich. Fuel-feed system of combustion chamber in an impulse-effect machine for plastic metal working. 3,891,380, Cl. 431-1.000.

Konrad, Charles Edward, to General Electric Company. Speed control unit for electric vehicles. 3,891,902, Cl. 318-139.000.

Kopito, Louis: *See—*
Schuster, Samuel R.; and Kopito, Louis, 3,891,325.

Koppers Company, Inc.: *See—*
Cox, Gordon L.; and Williams, Olin E., 3,891,429.
Reinfeld, Kurt; and Gouye, Emmanuel V., 3,891,026.
Snader, Earle Stuart, 3,891,414.

Koppers, Manfred; and Kuhnapfel, Friedhelm, to Rheinstahl AG. Support advancing apparatus for mines. 3,890,793, Cl. 61-45.00D.

Korpel, Adrianus; and Whitman, Robert L., to Zenith Radio Corporation. Method and apparatus for acoustical imaging. 3,890,829, Cl. 73-67.50H.

Korver, Jan Abraham Cornelis: *See—*
Janssen, Peter Johannes Hubertus; van Hattum, Johannes Simon Albert; and Korver, Jan Abraham Cornelis, 3,891,800.

Koshiba, Masao: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 3,891,638.

Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, to Instytut Przemyslu Farmaceutycznego. Method for preparation of a new antifungal antibiotic. 3,891,505, Cl. 195-80.00R.

Kotone, Akira; Hoda, Masahiro; and Hori, Takeshi, to Sakai Chemical Industry Company, Ltd. Ferrous metals treated with imidazole compounds for corrosion resistance. 3,891,470, Cl. 148-6.140.

Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon Buhrle & Co. Method for grinding bevel- or hyperboloid-shaped gears. 3,891,407, Cl. 51-287.000.

Kowa Company, Ltd.: *See—*
Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,891,506.

Koyama, Tatsuo: *See—*
Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, 3,891,100.

Kozak, Theodore F., to Union Carbide Corporation. Disposable absorbent article containing slitted hydrogel film. 3,890,974, Cl. 128-287.000.

Kraft, Erich: *See—*
Schluter, Siegfried Hans-Dietmar; and Kraft, Erich, 3,891,030.

Kratsch, Henry W.; and Doehling, Theodore W., to Medslist Industries, Inc. Furniture piece fabricating machine. 3,891,134, Cl. 227-14.000.

Kraus, Peter, to Messerschmitt-Boelkow-Blohm GmbH. Apparatus for safeguarding the spacing between successive bodies, especially vehicles on a track. 3,891,168, Cl. 246-167.00R.

Kraus, Werner; and Viehbach, Hans-Dieter, to Kraus, Werner. Electrical apparatus generating a low frequency, alternating magnetic field for promoting the growth of bone and other body tissues. 3,890,953, Cl. 128-1.500.

Kremen, Jerome C.; and Landa, Isaac, to Baxter Laboratories, Inc. Energy compensated spectrofluorometer. 3,891,853, Cl. 250-458.000.

Krempel, Alfred: *See—*
Bauer, Kurt; Findeiss, Helmut; and Krempel, Alfred, 3,891,781.

Kritzberg, Nathan I., to Psychotherapeutic Devices, Inc. Psychological testing and therapeutic game device. 3,891,209, Cl. 273-1.00R.

Krueger Metal Products, Inc.: *See—*
Crossman, Philip Edgar; and Resch, Richard Jerome, 3,891,270.

Kruger, Jean J.; and Rositto, Vincent E., to said Vincent E. Rossitto, by said Jean J. Kruger. Method for removing liquid contaminants from a submerged tank. 3,890,796, Cl. 61-69.000.

Kruka, Vitold R.: *See—*
Smitherman, Chester L., Jr.; Overcashier, Robert H.; and Kruka, Vitold R., 3,891,593.

Kubik, Paul P. Holder for revolver loader. 3,890,733, Cl. 42-89.000.

Kubota, Toshiro: *See—*
Yamada, Keiko; Kamino, Kimiyuki; and Kubota, Toshiro, 3,891,879.

Kuchner, Karl: *See—*
Heil, Eduard; Kuchner, Karl; Sliwka, Wolfgang; and Smits, Harald, 3,891,603.

Kuhlman Corporation: *See—*
Dulude, Donald O.; and Winbigler, Paul H., 3,891,823.

Kuhn, Hans, to F. B. Hatebur A.G. Tongs for use in a multi-stage forging press. 3,891,260, Cl. 294-90.000.

Kuhn, Rainer; and Schon, Nikolaus, to Bayer Aktiengesellschaft. Process for the production of thermoreversible coacervates. 3,891,607, Cl. 260-80.30N.

Kuhnapfel, Friedhelm: *See—*
Koppers, Manfred; and Kuhnapfel, Friedhelm, 3,890,793.

Kumagai, Tom T.; Leone, William C.; May, Michael; Shoemaker, Harold L.; and Howard, Roy A., to Houdaille Industries, Inc. Machine tool motor control with position offset. 3,891,910, Cl. 318-572.000.

Kunikane, Makoto: *See—*
Yasumori, Akiyoshi; Ohta, Katsuichi; Kunikane, Makoto; and Abe, Michiharu, 3,891,513.

Kunzle, Franz Martin: *See—*
Schmutz, Jean; Hunziker, Fritz; and Kunzle, Franz Martin, 3,891,647.

Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., to Merck & Co., Inc. 2-Alpha-carboxy-3-alpha(hydroxyethyl)-5-oxocyclopentane derivatives. 3,891,676, Cl. 260-340.900.

Kupper, Walter E.: *See—*
Hall, Donivan L.; and Kupper, Walter E., 3,891,041.

Kuramoto, Yoshio: *See—*
Ueda, Hiroshi; and Kuramoto, Yoshio, 3,891,992.

Kurek, Thaddeus P.: *See—*
Peterson, Marvin A.; Good, Adrian J.; and Kurek, Thaddeus P., 3,891,601.

Kurz, Gunter: *See—*
Muszumanski, Trude; Kurz, Gunter; and Wendisch, Irngard, 3,891,304.

Kusano, Masaaki: *See—*
Okuhara, Shinzi; Kusano, Masaaki; and Kawanami, Mitsuru, 3,891,866.

Kuster & Co. GmbH: *See—*
Eckhardt, Wilhelm; and Kuster, Klaus, 3,890,743.

Kuster, Klaus: *See—*
Eckhardt, Wilhelm; and Kuster, Klaus, 3,890,743.

Kustom Electronics, Inc.: *See—*
Aker, John L., 3,891,946.

Kuwano, Nobuyori; and Tajima, Yasutomo, to Showa Manufacturing Co., Inc. Shock absorber for bicycles. 3,891,236, Cl. 280-283.000.

Kuxhouse, Benjamin; and Balzer, Russell R. Canopy supporting frame and canopy. 3,890,989, Cl. 135-7.10R.

Kyoei Denshi Kogyo Kabushiki Kaisha: *See—*
Yamada, Keiko; Kamino, Kimiyuki; and Kubota, Toshiro, 3,891,879.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Sato, Takaaki; and Ishida, Kengo, 3,891,770.

Labann Corporation: *See—*
Cothron, Lawson B., 3,890,813.

Labaz: *See—*
Descamps, Marcell; and Areschka, Alex, 3,891,648.

Ladany, Ivan; and Cannuli, Vincent Michael, to RCA Corporation. Deposition of epitaxial layer from the liquid phase. 3,891,478, Cl. 148-171.000.

Ladd, Floyd N.; and Stacy, Donald G., to Ford Motor Company. Window regulator mechanism. 3,890,742, Cl. 49-350.000.

Ladusaw, William T., to General Electric Company. Suction valve for rotary compressor. 3,891,358, Cl. 418-63.000.

Laffitte, Royce D., to Eastman Kodak Company. Process for preparing alpha-trichloride particles. 3,891,746, Cl. 423-492.000.

Lagerstrom, Gunnar, to Atlas Copco Aktiebolag. Method and device for drilling to a predetermined surface. 3,891,039, Cl. 175-40.000.

Lakah, Lucien: *See—*
Joullie, Maurice L.; Maillard, Gabriel; Lakah, Lucien; and Muller, Pierre, 3,891,749.

Lakin, Charles T.; and Leighty, William J., to Martin Marietta Corporation. Reference insertion device. 3,891,314, Cl. 353-101.000.

Lamberet, Paul. Equipment for manufacturing stratified isothermal panels. 3,891,484, Cl. 156-60.000.

Lambou, Madeline G.; Spadaro, James J.; and Rusch, Eunice M., to United States of America, Agriculture. Foam producing composition containing whey solids. 3,891,571, Cl. 252-354.000.

Lamer, Gerald P.; and Holmes, Terry M., to J. I. Case Company. Boom members having stiffener elements for crane boom constructions. 3,890,757, Cl. 52-695.000.

Lamy, Jacques Edouard, to C. J. Doris. Anti-heave protective system. 3,890,790, Cl. 61-3.000.

Lance, James W.; and Jones, Henry M., to Mangrove Enterprise, Incorporated, The. Material treatment by cryogenic cooling. 3,891,477, Cl. 148-125.000.

Landa, Isaac: *See—*
Kremen, Jerome C.; and Landa, Isaac, 3,891,853.

Landry, Lawrence A.: *See—*
Booe, James M.; and Landry, Lawrence A., 3,891,901.

Landstorfer, Friedrich: *See—*
Meinke, Hans Heinrich; Flachenecker, Gerhard; Landstorfer, Friedrich; Lindenmeier, Heinz; and Fastenmeier, Karl, 3,891,319.

Lane, Charles E., III, to Honeywell, Inc. Method of making thermal recording print head. 3,890,702, Cl. 29-611.000.

Lanes, Nathan. Container-cap applying machine. 3,890,851, Cl. 74-400.000.

Langkau, John Frank, to Union Carbide Corporation. Galvanic cell structure. 3,891,462, Cl. 136-111.000.

Langley, Robert; and Barraclough, Ronald, to Ciba-Geigy Corporation. Phythlocyanine pigments. 3,891,455, Cl. 106-288.00Q.

Larsen, Eric R.; and Ecker, Ernest L., to Dow Chemical Company, The. Brominated pentaerythritolic polyesters and process therefor. 3,891,605, Cl. 260-75.00H.

Larson, Clayton E., to White Metal Rolling & Stamping Corporation. Ladder stabilizers. 3,891,054, Cl. 182-107.000.

Laskaris, Evangelos T., to General Electric Company. Superconducting rotor. 3,891,875, Cl. 310-40.000.

Latta, Bruce M.; and Willard, John J., Jr., to J. P. Stevens and Co., Inc. Method for checking the yarn pattern in a fabric. 3,891,387, Cl. 8-18.000.

Latva, Henry F., to Chrysler Corporation. Heat treating atmospheres. 3,891,473, Cl. 148-16.700.

Laub, Joseph L.; and Hurst, John F., to Unitek Corporation. Pulse heated thermocompression bonding apparatus. 3,891,822, Cl. 219-85.000.

Lauer, William: *See—*
Aspelin, Gary Bertil; Caffrey, Richard Francis; and Lauer, William, 3,890,966.

Laurizio, Jeremiah J., to American Flange & Manufacturing Co., Inc. Plastic bonded closure. 3,891,118, Cl. 220-288.000.

Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, to Compagnie Generale d'Electricite. Gas laser generator with discharge container gas flow circulation. 3,891,944, Cl. 331-94.50G.

Lavaux, Jean-Paul: *See—*
Derible, Pierre Henri; and Lavaux, Jean-Paul, 3,891,636.

Lawall, Thomas R.; and Porter, Edward S., to Fuller Company. Apparatus for calcining raw material. 3,891,382, Cl. 432-58.000.

Lawrence, Raymond Keith, to Girling Limited. Brake shoes. 3,891,069, Cl. 188-250.00G.

Lawson, Gustaf Rudolph; and Stuart, John H., to AMP Incorporated. Wire stripper. 3,890,858, Cl. 81-9.50R.

Lawson, Richard, to Ames Rubber Corporation. Method of forming precisely dimensioned apertures. 3,891,739, Cl. 264-155.000.

Layne, Gilbert S.; and Huml, James O., to Dow Chemical Company, The. Process for the preparation of metal and metal fluoride products. 3,891,690, Cl. 423-465.000.

Lea, Darrel Bernard: *See—*
Lea, Darrell Bernard; and Klein, Laszlo, 3,890,725.

Lea, Darrell Bernard; and Klein, Laszlo, to Lea, Darrel Bernard; Marcus, Robert Phillips; and Gilman, Howard lee. Shoe construction. 3,890,725, Cl. 36-11.500.

Leaman, Harold E.: *See—*
Roberson, Cletis L.; Russell, Robert G.; Stream, Ralph M.; and Leaman, Harold E., 3,890,925.

Lebryk, Matthew J. Method of forming a cotter key hole in a bolt. 3,890,663, Cl. 10-27.00R.

Lectromelt Corporation: *See—*
Persson, John A., 3,891,427.

Lee, Edward, to Solv-X Inc. Cleaning assembly for automotive parts and the like. 3,890,988, Cl. 134-111.000.

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Lee, Herschel D., Jr.: *See—*
Lee, Herschel D., Sr.; and Lee, Herschel D., Jr., 3,891,052.

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Lehikoinen, U. Albert: *See—*
Braxton, Henry G., Jr.; and Lehikoinen, U. Albert, 3,891,448.

Lehmann, Adolf, to Daimler-Benz Aktiengesellschaft. Lock mechanism. 3,891,252, Cl. 292-6.000.

Leighty, William J.: *See—*
Lakin, Charles T.; and Leighty, William J., 3,891,314.

Lenert, Richard W.: *See—*
Ishman, Neal H.; Lenert, Richard W.; and Goldman, Jeffrey B., 3,891,926.

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Leonard, Sidney H., Sr.: *See—*
Leonard, Sidney H., Jr., 3,890,678.

Leonard, Verna M. Octave locator for keyboard and note reading. 3,890,875, Cl. 84-471.000.

Leone, William C.: *See—*
Kumagai, Tom T.; Leone, William C.; May, Michael; Shoemaker, Harold L.; and Howard, Roy A., 3,891,910.

Lepagnol, Guy Pierre: *See—*
Daguet, Jacques Lucien; Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, 3,891,803.

Lerner, Martin L., to Zenith Radio Corporation. Apparatus for re-etching a color cathode ray tube shadow mask. 3,891,491, Cl. 156-345.000.

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Lesny, Lucian J.: *See—*
Herr, Kurt F.; Heck, Dennis A.; Lesny, Lucian J.; and Ward, Ronald L., 3,891,838.

Lester, John M.: *See—*
Barney, Kay H.; and Lester, John M., 3,891,989.

Leto, Alfred R.: *See—*
Belmuth, Harold; and Leto, Alfred R., 3,891,378.

Lett, Laurence W. Brake shoe hold down spring tool. 3,891,185, Cl. 254-10.500.

Leutwyler, Robert: *See—*
Zullig, Heinz; and Leutwyler, Robert, 3,890,808.

Lever Brothers Company: *See—*
Carpenter, Roland Paul; Cowie, William Pirie; Heyes, Alan; and Sutton, Anthony Hubert, 3,891,776.
Pryce, Alan, 3,891,689.

Levert, Henri: *See—*
Gervais, Edouard; Levert, Henri; and Chollet, Pierre, 3,891,024.

Levin, Herman: *See—*
United States of America, National Aeronautics and Space Administration; Levin, Herman; Auker, Byron H.; and Gardos, Michael N., 3,891,452.

Levin, Robert E., to GTE Sylvania Incorporated. Method of making a controlled-diffusion stippled reflector by sag molding. 3,891,421, Cl. 65-107.000.

Leviton Manufacturing Co., Inc.: *See—*
Poliak, John M.; and Lopez, Juan M., 3,891,297.

Lewis, Clarke H.: *See—*
Richardson, John L.; Brodie, Alexander O.; and Lewis, Clarke H., 3,891,556.

Lewis, John; and Gilmour, William Dudley, to Lewis Security Systems, Ltd. Security systems. 3,891,980, Cl. 340-258.00D.

Lewis Security Systems, Ltd.: *See—*
Lewis, John; and Gilmour, William Dudley, 3,891,980.

Lewis, Terence E.: *See—*
Hawley, William L.; and Lewis, Terence E., 3,891,175.

Lhenry, Bernard, to Creusot-Loire. Apparatus for shearing the edges of a sheet of metal. 3,890,862, Cl. 83-71.000.

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Licentia-Patent-Verwaltungs-G.m.b.H.: *See—*
Beneking, Heinz, 3,891,993.
Messerschmidt, Jurgen; and Schimmer, Rigobert, 3,891,483.

Licentia Patent-Verwaltungs-GmbH: *See—*
Marquardt, Jurgen; and Pivit, Erich, 3,891,949.
Offermann, Bernd Peter, 3,891,855.
Schoberl, Werner, 3,891,858.

Liconix: *See—*
Dowley, Mark W.; and Shull, William A., 3,891,943.
Hawkins, Joseph D., 3,891,308.

Lieberman, Gilbert: *See—*
Ellingson, Herman E.; and Lieberman, Gilbert, 3,890,913.

Liedhegener, Friedel: *See—*
Bartholomaus, Reiner; Bernd, Hubert; and Liedhegener, Friedel, 3,891,145.

Lif-O-Gen, Inc.: *See—*
Mills, Justin W., Jr.; and Betzler, Mark H., 3,891,195.

Lile, Pleasant M. Wire gate latch. 3,891,254, Cl. 292-113.000.

Limberg, Allen Leroy, to RCA Corporation. Transistor biasing arrangement. 3,891,935, Cl. 330-22.000.

Lin, Din-Min. Method of embossing with manually adjustable patterns or designs. 3,891,485, Cl. 156-63.000.

Linck, Drew W.: *See—*
Wilkerson, Joseph B.; and Linck, Drew W., 3,891,163.

Lind, Wilton H.: *See—*
Katsumoto, Kiyoshi; and Lind, Wilton H., 3,891,680.

Linde Aktiengesellschaft: *See—*
Dresler, Helmut, 3,890,997.

Linden-Alimak AB: *See—*
Thorsell, Sven Torgny, 3,891,186.

Lindenmeier, Heinz: *See—*
Meinke, Hans Heinrich; Flachenecker, Gerhard; Landstorfer, Friedrich; Lindenmeier, Heinz; and Fastenmeier, Karl, 3,891,319.

Lintzenich, Vincent C., to Shell Oil Company. Phosphoramidate derivatives. 3,891,667, Cl. 260-308.00R.

Liogonky, Boris Izrailevich: *See—*
Berlin, Alfred Anisimovich; Liogonky, Boris Izrailevich; and Zapadinsky, Boris Isaakovich, 3,891,633.

Lion Fat & Oil Co., Ltd.: *See—*
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,891,683.

Lipe, Gordon C.; and Abbott, William S. Audio-visual warning system. 3,891,986, Cl. 340-371.000.

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Lista, Edwin L.; and Williams, Kenneth S., to Aerojet-General Corporation. Staple orienting apparatus. 3,890,877, Cl. 86-1.000.

Litton Systems, Inc.: *See—*
Tuffias, Robert H., 3,891,282.

Lively, Gerald W.: *See—*
Hohman, Alvin E.; and Lively, Gerald W., 3,891,456.

Livezey, Jack A.: *See—*
Amelio, Gilbert F.; Livezey, Jack A.; and Salsbury, Phillip J., 3,891,977.

Lloyd, E. J.: *See—*
Shackelford, Albert D.; Holladay, John H.; and Lloyd, E. J., 3,891,097.

Lock, David A.: *See—*
Field, Peter G. S.; and Lock, David A., 3,891,711.

Loepiktie, Stephanus F.: *See—*
Baker, Richard J.; Miller, Timothy A.; Erlinger, Gary K.; Loepiktie, Stephanus F.; and Hanselman, Larry R., 3,891,774.

Loesch, Claude E.: *See—*
Loesch, Leo J.; and Loesch, Claude E., 3,891,120.

Loesch, Leo J.; and Loesch, Claude E. Operation monitor for air pressure type seed planter. 3,891,120, Cl. 221-2.000.

Lohr, Raymond J.: *See—*
Auer, Robert Thomas; Campbell, Laurie Jay; Lohr, Raymond J.; and Smith, James, 3,891,234.

Loikitz, Frank, to Buildex Incorporated. Cross brace interlock. 3,891,334, Cl. 403-234.000.

Lombardino, Joseph G., to Pfizer Inc. Process for the production of carboxamides of oxo-1,2-benzothiazine-1,1-dioxides. 3,891,637, Cl. 260-243.00R.

Londontown Manufacturing Co., The: *See—*
Mager, Julian, 3,891,204.

Lonza Ltd.: *See—*
Nicolet, Rene; and Gutmann, Walter, 3,891,723.

Looger, Lonnie L.; and Vickers, Wiley B., to United States of America, Army. Anti-tank launcher. 3,890,879, Cl. 89-1.816.

Loose, Guenter H.; Diesel, William J.; and Graczyk, Thadeus S., to Eastman Kodak Company. Ultrasonic marking. 3,890,892, Cl. 101-32.000.

Lopez, Juan M.: *See—*
Poliak, John M.; and Lopez, Juan M., 3,891,297.

Lopez, Oscar. Saliva ejector. 3,890,712, Cl. 32-33.000.

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Lormand, Jerome D.: *See—*
Eagleton, Harold N.; Lormand, Jerome D.; and Herring, Joe S., 3,890,693.

Louisiana-Pacific Corporation: *See—*
Johnson, Waldo O.; and Buynak, Robert G., 3,890,741.

Love Oil Company, Inc.: *See—*
Smith, Owen; and Holder, James F., 3,891,394.

Lowther, Frank E., to Purification Sciences Inc. Corona generator apparatus. 3,891,561, Cl. 250-541.000.

Lubbock, Frederick John: *See—*
Kershaw, Robert William; Lubbock, Frederick John; and Polgar, Livia, 3,891,577.

Lucas Aerospace Limited: *See—*
Neal, Francis John; and Simmons, John Richard, 3,890,803.

Lucas Electrical Company Ltd., The: *See—*
Harris, John Derek; and Wood, Francis Roy, 3,891,881.
Southgate, John Peter, 3,891,888.

Lucasey, Joseph A.; and Boscacci, William L., to Lucasey Manufacturing Corporation. Portable elevator apparatus. 3,891,063, Cl. 187-11.000.
Lucasey Manufacturing Corporation: *See—*
Lucasey, Joseph A.; and Boscacci, William L., 3,891,063.
Lucke, Robert James, Jr.: *See—*
Miller, Wayne Russel; and Lucke, Robert James, Jr., 3,890,995.
Lundh, Bengt Olov: *See—*
Carmel, Amichai Meir; and Lundh, Bengt Olov, 3,891,549.
Lunsford, Carl Dalton; and Cale, Albert Duncan, Jr., to A. H. Robins Company, Incorporated. 5-(2-Aminoethyl)-2,3-dioxopiperazines. 3,891,646, Cl. 260-268.0DK.
Lupin, Michael S.: *See—*
Becker, Alan M.; Epstein, Joseph A.; Lupin, Michael S.; and Zolotov, Shaul, 3,891,544.
Lutz, Gerhard: *See—*
Rometsch, Werner; Robeller, Walter; Lutz, Gerhard; Reichel, Eckehart; Bosch, Paul; and Vohringer, Gerd, 3,890,883.
Lycett, Peter; and Kempson, Kenneth William, to Bloxwich Lock and Stamping Company Limited, The. Doors for containers and the like. 3,891,112, Cl. 220-1.500.
Lyman, Merton C., Jr.; and Berry, Ronald, to Rockwell International Corporation. Let-back mechanism for looms. 3,891,010, Cl. 139-313.000.
M & J Valve Company: *See—*
Grove, Marvin H.; and Wailes, Rodney A., 3,890,991.
Machida, Mikiko: *See—*
Kanaoka, Yuichi; Machida, Mikiko; and Machida, Minoru, 3,891,670.
Machida, Minoru: *See—*
Kanaoka, Yuichi; and Machida, Minoru, 3,891,669.
Kanaoka, Yuichi; Machida, Mikiko; and Machida, Minoru, 3,891,670.
MacMillan, Archie J.: *See—*
Romeo, Donald E.; and MacMillan, Archie J., 3,891,936.
MacNeilage, George C. Earthquake actuated fluid flow obstructing device. 3,890,993, Cl. 137-45.000.
Maconachie, Ian Christy, to Reinforced Shuttlecocks Limited. Shuttlecocks. 3,891,215, Cl. 273-106.00A.
Madag Maschinen- und Apparatebau Dietikon AG: *See—*
Zullig, Heinz; and Leutwyler, Robert, 3,890,808.
Maeda, Kihachiro: *See—*
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; Maeda, Kihachiro; and Ishiguro, Toshihiro, 3,891,763.
Maekuma, Koichi: *See—*
Abe, Toshizo; Sakamoto, Seiho; Go, Shigeo; Maekuma, Koichi; Yamada, Yoshitaka; and Hirashima, Yasumasa, 3,891,611.
Mager, Julian, to Londontown Manufacturing Co., The. Transfer mechanism for sheet material. 3,891,204, Cl. 271-85.000.
Mahoney, Robert E., to Air Preheater Company, Inc., The. Rotor assembly for vertical shaft air preheater. 3,891,029, Cl. 165-8.000.
Maier, Alfred E.: *See—*
Yorgin, Nick; and Maier, Alfred E., 3,891,298.
Maier, Elmar; Tilg, Robert; and Walser, Karl, to Hilti Aktiengesellschaft. Fastening element feed mechanism for an explosion charge-driven setting gun. 3,891,133, Cl. 227-10.000.
Maier, Jorg: *See—*
Bichsel, Heinz F.; Furrer, Peter; and Maier, Jorg, 3,891,433.
Maillard, Gabriel: *See—*
Joullie, Maurice L.; Maillard, Gabriel; Lakah, Lucien; and Muller, Pierre, 3,891,749.
Maio, Kenji: *See—*
Fujimoto, Ryoichi; Takasugi, Kazuo; Inose, Fumiyuki; Maio, Kenji; and Yokozawa, Norio, 3,890,798.
Makarowska-Plociennik, Zofia Eliza: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.
Maki, Naoki, to Hitachi, Ltd. Linear synchronous motor for magnetically levitated vehicle. 3,890,906, Cl. 104-148.0SS.
Malloy, Richard J., to United States of America, Navy. Laser controlled fathometer. 3,890,840, Cl. 73-290.00V.
Mangrove Enterprise, Incorporated, The: *See—*
Lance, James W.; and Jones, Henry M., 3,891,477.
Manitowoc Company, Inc., The: *See—*
Hunter, Charles A., II; Pech, David J.; and Morrow, James G., Sr., 3,891,264.
Mannesmann-AG: *See—*
von Klenck, Jurgen; Michel, Erich; and Gerstenacker, Klaus-Dieter, 3,890,908.
Mannesmann Aktiengesellschaft: *See—*
Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 3,891,730.
Mannesmannrohren-Werke Aktiengesellschaft: *See—*
Schirmag, Klaus-Peter, 3,891,081.
Tummers, Josef; and Pisarik, Walter, 3,890,916.
Manning, William Truman: *See—*
Wilhelm, Max G.; Manning, William Truman; and O'Neil, James D., 3,891,782.
Manoogian, Alex; and Pullen, Eric V., to Masco Corporation of Indiana. Single handle water faucet valve. 3,891,005, Cl. 137-625.400.
Mansei Kogyo Kabushiki Kaishya: *See—*
Moriya, Nobuyoshi, 3,891,381.
Mansfield Sanitary, Inc.: *See—*
Fulton, Howard A., 3,890,652.
Marathon Oil Company: *See—*
Norton, Charles J.; and Falk, David O., 3,891,567.
Marcade, Rogue D.: *See—*
Marcussen, Henry; and Marcade, Rogue D., 3,890,987.
Marce, Roger: *See—*
Delestrade, Andre; and Marce, Roger, 3,891,038.
Marciniak, Harry W.; Carlson, Richard D.; and Dever, James L., to Hooker Chemicals & Plastics Corporation. Fire retardant polymer compositions. 3,891,599, Cl. 260-45.70R.
Marconi Company Limited, The: *See—*
Phillips, Geoffrey John; and Chambers, John Philip, 3,891,994.
Marcus, Robert Phillips: *See—*
Lea, Darrell Bernard; and Klein, Laszlo, 3,890,725.
Marcus, Thomas J., to Rockwell International Corporation. Tracker unit. 3,891,798, Cl. 178-6.800.
Marcussen, Henry; and Marcade, Rogue D., to Whirlpool Corporation. Washing apparatus with auxiliary distributor. 3,890,987, Cl. 134-57.00D.
Marcussen, Henry, to Whirlpool Corporation. Manual screen filter for automatic washer and method. 3,891,548, Cl. 210-65.000.
Mardiguian, Jean; and Fournier, Pierre, to Societe anonyme dite: MAR-PHA, Societe d'Etude et d'Exploitation de Marques. Heparin esters. 3,891,622, Cl. 260-211.00R.
Maremont Corporation: *See—*
Downing, Todd R.; and Nolen, Robert K., 3,891,176.
Marforio, Nerino, to Virginio Rimoldi & C. S.p.A. Detector device of thread breakage on a sewing machine. 3,891,812, Cl. 200-61.180.
Margen, Peter Heinrich Erwin, to Aktiebolaget Atomenergi. Method and means for heating buildings in a district heating system with waste heat from a thermal power plant. 3,890,787, Cl. 60-648.000.
Marion Health & Safety, Inc.: *See—*
Avery, Carl Frederick, 3,891,331.
Marley, Kenneth C.: *See—*
Well, Dale E.; and Marley, Kenneth C., 3,891,037.
Maroschak, Ernest J. Method of making corrugated plastic pipe with integral coupler collars. 3,891,733, Cl. 264-40.000.
Marquardt, Jurgen; and Pivit, Erich, to Licentia Patent-Verwaltungs-GmbH. Slit line-type microwave circuit construction. 3,891,949, Cl. 333-84.00R.
Marquette, John L. Plug-in equipment shipping container and rack system. 3,891,288, Cl. 312-338.000.
Marsh, Alexander J.; and Sargent, Henry O., to Reynolds Metals Company. Method of making a heat shrinkable film of polyethylene copolymers thereof and article produced therefrom. 3,891,737, Cl. 264-95.000.
Marshall, Tommy G., to McDonnell Douglas Corporation. Washer for electrically connecting the tubes of a fluid line. 3,891,290, Cl. 339-15.000.
Martin, Barrie James: *See—*
Moss, Norman; Martin, Barrie James; and Broad, Michael John, 3,890,935.
Martin Marietta Corporation: *See—*
Lakin, Charles T.; and Leighty, William J., 3,891,314.
Marx Toys Division of The Quaker Oats Company: *See—*
Auer, Robert Thomas; Campbell, Laurie Jay; Lohr, Raymond J.; and Smith, James, 3,891,234.
Marzolf, Richard T., to Dow Chemical Company, The. Bubble-free, high barrier vinylidene chloride polymer films and process of preparation. 3,891,598, Cl. 260-42.560.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Fischer, Hermann, 3,890,898.
Maschinenfabrik Schweiter AG: *See—*
Dietiker, Ernst, 3,891,154.
Maschinenfabrik Weingarten AG: *See—*
Reihle, Markus; and Harsch, Erich, 3,890,863.
Masco Corporation of Indiana: *See—*
Manoogian, Alex; and Pullen, Eric V., 3,891,005.
Mason, John A., to Anderson Company, The. Wiping element of a wiper blade. 3,890,667, Cl. 15-250.420.
Mason, Ronald C.: *See—*
Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., 3,890,911.
Masuda, Shigeo; and Tanaka, Toshihiko, to Sumitomo Electric Industries, Ltd. Method of electrocoating electric wire. 3,891,526, Cl. 204-181.000.
Masure, Daniel: *See—*
Bouy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, 3,891,531.
Masyc AG: *See—*
Specht, Dieter, 3,890,755.
Mata, Justo Martinez; and Stapley, Edward O., to Merck & Co., Inc. Antibiotic prenomycin and process of producing the same. 3,891,753, Cl. 424-118.000.
Mata, Justo Martinez: *See—*
Stapley, Edward O.; and Mata, Justo Martinez, 3,891,754.
Material Distributors Corporation: *See—*
Willdorf, Michael E., 3,891,486.
Mathis, Cleo D. Whirlpool jet for bathtubs. 3,890,655, Cl. 4-178.000.
Mathis, Cleo L. Whirlpool jet for bathtubs. 3,890,656, Cl. 4-178.000.
Matier, William L.: *See—*
Catt, John D.; and Matier, William L., 3,891,703.
Matsuda, Kazuo; Tanaka, Yoshiaki; and Sakai, Takeyo, to Kao Soap Co., Ltd. Process for polymerization of tetrahydrofuran. 3,891,715, Cl. 260-615.00B.

Matsumoto, Takamasa: *See—*
Takenouchi, Senji; Yanai, Tautomu; Matsumoto, Takamasa; and Ohtani, Hiroyoshi, 3,891,051.

Matsumura, Koichi: *See—*
Muto, Eiji; Kawarabayashi, Tsuneo; Matsumura, Koichi; and Tamura, Hitoshi, 3,891,465.

Matsushita Electric Industrial Co., Ltd.: *See—*
Nagata, Takashi; and Mindlin, Raymond David, 3,891,872.
Tsukamoto, Masahide; and Ohtsuka, Tetsuro, 3,891,307.
Wakabayashi, Takashi, 3,891,958.

Mattei, Silvano: *See—*
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,891,819.

Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, to Dainippon Ink & Chemicals Inc.; and Dai-Nippon Suban Manufacturing Co. Ltd. Method for cultivating yeasts. 3,891,503, Cl. 195-28.00R.

Matuszak, Michael L.: *See—*
Roberts, Michael G.; and Matuszak, Michael L., 3,891,596.

Maul, James J.; and Carlson, Richard D., to Hooker Chemicals & Plastics Corporation. Halogen containing fire retardant additive with improved heat stability. 3,891,600, Cl. 260-45.75R.

Maupin, George R.: *See—*
Hall, William P.; and Maupin, George R., 3,891,328.

Maurer, John R., to Plummer, Walter A. Kit of components and a method of protecting steel piling from corrosion. 3,890,795, Cl. 61-54.000.

Maxwell, Jerome Eugene, to TRW Inc. Multi-function digital counter/timer. 3,891,973, Cl. 340-172.500.

May, Michael: *See—*
Kumagai, Tom T.; Leone, William C.; May, Michael; Shoemaker, Harold L.; and Howard, Roy A., 3,891,910.

May, Robert F., to Chrysler Corporation. Missile directional control system. 3,891,166, Cl. 244-3.220.

Mayer & Cie. Maschinenfabrik: *See—*
Grozinger, Gerhard, 3,890,806.

Mayer, Fred. Wheeled cart supported luggage. 3,891,230, Cl. 280-43.240.

Mayers, Bernard J.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 3,891,710.

Maynard, George A., to Textron Inc. Nail package improvements for interconnecting the trailing nail of one nail package with the leading nail of another nail package. 3,891,087, Cl. 206-346.000.

Mayo, Alfred M.: *See—*
O'Neal, Cothburn M.; and Mayo, Alfred M., 3,891,141.

Maznichenko, Stanislav Anisimovich: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.

McCartney, Charles P., Jr.; and Willmann, Norman L., to General Motors Corporation. Negative lead-acid battery plates with expanded lead sheet grids. 3,891,459, Cl. 136-26.000.

McCarty, Michael, to Special Metals Corporation. Desulfurization of transition metal alloys. 3,891,425, Cl. 75-10.00V.

McClure Furniture Industries, Inc.: *See—*
Fantoni, Marco, 3,890,671.
Fantoni, Marco, 3,890,814.

McConnell, Bobby L.: *See—*
Reid, James P., Jr.; and McConnell, Bobby L., 3,891,386.

McConnell, Kennedy: *See—*
Coleman, Bestor P.; and McConnell, Kennedy, 3,891,073.

McCoy, Archibald Henry Richard. Method and means for adjusting the elevation of manhole covers. 3,891,337, Cl. 404-26.000.

McDonald, Charles H. Elastomeric pavement repair composition for pavement failure and a method of making the same. 3,891,585, Cl. 260-28.5AS.

McDonald, Michael P.: *See—*
Rhoton, Richard S.; and McDonald, Michael P., 3,891,833.

McDonnell Douglas Corporation: *See—*
Finnell, Joseph C., 3,891,797.
Hopper, Richard A., 3,891,246.
Marshall, Tommy G., 3,891,290.

McDowell, Maurice James: *See—*
Chang, David Chi-kung; and McDowell, Maurice James, 3,891,591.

McElroy, David C.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P., 3,890,772.

McFarlan, Alden I.: *See—*
McFarlan, Edward Russell, 3,891,027.

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McFarland, James W., to Pfizer Inc. ω-(3-Hydroxyphenyl)substituted amidines and derivatives thereof as anthelmintic agents. 3,891,698, Cl. 260-501.140.

McGregor, Walter, to Ethicon, Inc. Controlled release suture. 3,890,975, Cl. 128-339.000.

McGuire, Robert D.: *See—*
Hauser, Hans; and McGuire, Robert D., 3,890,850.

McInerney, Michael J.; Brady, Robert T.; and Phillips, Alvia E., to Vapor Corporation. Hot water generator for shock testing fabricated piping components. 3,890,936, Cl. 122-248.000.

McIntosh, Alex A. Rotary engine with improved seal and timing mechanism providing linear acceleration between pistons during the power stroke. 3,890,939, Cl. 123-8.470.

McKay, Donald R.; and Swinkels, Godefridus M., to Cominco Ltd. Hydrometallurgical process for treating copper-iron sulphides. 3,891,522, Cl. 204-108.000.

McKenzie, James M.; and Sachs, Jeffrey L., to Draf Tool Co., Inc. Automatic temperature control system analyzer. 3,890,836, Cl. 73-168.000.

McKenzie, Thomas J. Surface texture modification device for carpets. 3,890,666, Cl. 15-142.000.

McMahon, Donald H., to Sperry Rand Corporation. Coherent optical processor apparatus with improved fourier transform plane spatial filter. 3,891,968, Cl. 340-146.30E.

McMillian, Lonnie S.: *See—*
Pierce, Oscar L.; Hutchison, Arthur H.; King, Olin B.; and McMillian, Lonnie S., 3,890,968.

Meacham, George W. Rotary engine. 3,891,359, Cl. 418-104.000.

Mead Corporation, The: *See—*
Jensen, Gerald A.; and Parsonage, Harry N., 3,891,532.
Stoneburner, Leonard G., 3,891,121.

Mead Johnson & Company: *See—*
Catt, John D.; and Matier, William L., 3,891,703.

Meador, Richard A.; Arnold, Richard H.; and Paap, Hans J., to Texaco Inc. Dual radio frequency measurement of dielectric constant and resistinity of borehole media. 3,891,916, Cl. 324-6.000.

Mechanical Technology Incorporated: *See—*
Roters, Herbert C., deceased; and Roters, Mary D., executrix, 3,891,874.

Medental, Inc.: *See—*
Mowrer, Ronald L.; Ebbler, Robert W.; and Gates, Major F., 3,891,002.

Medical Products Corporation: *See—*
Bazell, Seymour; Ostensen, Ralph G.; and Goldberg, Edward M., 3,890,976.

Medlock, Alfred A. Self-elevating scaffold construction. 3,891,055, Cl. 182-141.000.

Medslist Industries, Inc.: *See—*
Kratsch, Henry W.; and Doehling, Theodore W., 3,891,134.

Megatech Corporation: *See—*
Haldeman, Charles W., 3,890,950.

Mehaffey, Dennis G.: *See—*
Geary, Riley R.; and Mehaffey, Dennis G., 3,891,217.

Mehta, Shashi Pal, to Abbott Laboratories. Dosage formulation for erythromycin cetyl sulfate. 3,891,755, Cl. 424-157.000.

Meinke, Hans Heinrich; Flachenecker, Gerhard; Landstorfer, Friedrich; Lindenmeier, Heinz; and Fastenmeier, Karl, to Eltro GmbH Gesellschaft Fuer Strahlung Stechnik. Receiver for impulse-shaped light signals. 3,891,319, Cl. 356-5.000.

Melhose, Alfred E., to Bell Telephone Laboratories, Incorporated. Coding device with light responsive key generator. 3,891,799, Cl. 178-22.000.

Melnick, Irving. Impregnated magnetic flap valve. 3,891,000, Cl. 137-525.300.

Melphor Inc.: *See—*
Williams, Richard E., 3,891,920.

Mennuto, Anthony R. Door assembly including insert storing means. 3,891,020, Cl. 160-37.000.

Mentel, Jurgen: *See—*
Hertz, Walter; Mentel, Jurgen; and Stroh, Jan, 3,891,814.

Menzies, Robert T.: *See—*
United States of America, National Aeronautics and Space Administration; and Menzies, Robert T., 3,891,848.

Merck & Co., Inc.: *See—*
Hannah, John; Rogers, Edward F.; and Graham, Donald W., 3,891,758.
Kollonitsch, Janos; Scott, Alan N.; and Doldouras, George A., 3,891,668.
Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., 3,891,676.
Mata, Justo Martinez; and Stapley, Edward O., 3,891,753.
Stapley, Edward O.; and Mata, Justo Martinez, 3,891,754.
Veber, Daniel F.; and Brady, Stephen F., 3,891,692.
Witzel, Bruce E.; and Shen, Tsung-Ying, 3,891,699.

Merck Sharp & Dohme (I.A.) Corporation: *See—*
Wasson, Burton Kendall, 3,891,639.

Merrick, Joseph M. Method of rapid identification of gram-negative bacteria. 3,891,508, Cl. 195-103.500.

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Taege, Herbert; Flus, Friedrich; and Mertens, Gunther, 3,891,434.

Messerschmidt, Jurgen; and Schimmer, Rigobert, to Licentia-Patent-Verwaltungs G.m.b.H. Method for etching semiconductor surfaces. 3,891,483, Cl. 156-3.000.

Messerschmitt-Boelkow-Blohm GmbH: *See—*
Kraus, Peter, 3,891,168.

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Gunther, Rolf, 3,890,749.

Metabowerke KG Closs, Rauch, & Schnitzler: *See—*
Bauer, Friedrich, 3,890,708.

Mettler Instrumente AG: *See—*
Schmitter, Albert, 3,891,040.

Meyer, Georg Michael, to Deutsche Babcock & Wilcox Aktiengesellschaft. Method and apparatus for the production of nitrogen for use as an inert gas. 3,891,411, Cl. 55-26.000.

Meyerhoff, Walter: *See—*
Schonlau, Herbert; and Meyerhoff, Walter, 3,890,943.

Michel, Erich: *See—*
von Klenck, Jurgen; Michel, Erich; and Gerstenacker, Klaus-Dieter, 3,890,908.

Michel, Phlippoteau, to Scal (Societe de Conditionnement en Aluminum). Punch for manufacturing flexible conical tubes. 3,890,822, Cl. 72-273.000.

Migdalek, Laurence F.: *See—*
Coulter, Brent W.; and Migdalek, Laurence F., 3,891,974.

Mihailovski, Alexander, to Stauffer Chemical Company. Thioureido Sulfonanilide compositions. 3,891,688, Cl. 260-455.00A.

Mikhael, Wasfy Boushra; and Keys, Lloyd Kenneth, to Northern Electric Company Limited. Functionally tunable active low-pass filter. 3,891,938, Cl. 330-107.000.

Miki, Tokutaro: *See—*
Suzuki, Yasushi; Itaya, Toshihisa; Minami, Nobuyoshi; Tarutani, Masaaki; Miki, Tokutaro; and Miyasaka, Katsuhiko, 3,891,664.

Milam, David: *See—*
Schlossberg, Howard; and Milam, David, 3,891,945.

Miller, Albert: *See—*
Spiegel, William; Spiegel, Jacob; and Miller, Albert, 3,891,090.

Miller, Arthur O., to Hewlett-Packard Company. Wire pair identification system. 3,891,811, Cl. 179-175.30A.

Miller, David Frederick: *See—*
Blight, Dennis Jack; Miller, David Frederick; and Morgan, John Trevor, 3,891,292.

Miller, Eugene J.: *See—*
Ernst, Robert; and Miller, Eugene J., 3,891,682.

Miller, Gary E., to Technical Materials, Limited. Fruit bud retarding method and system. 3,890,740, Cl. 47-58.000.

Miller, Laurence B.; and Crook, James D., to Digmor Equipment & Engineering. Scarifier and scraper attachment for a tractor. 3,891,035, Cl. 172-197.000.

Miller, Timothy A.: *See—*
Baker, Richard J.; Miller, Timothy A.; Erlinger, Gary K.; Loepiktie, Stephanus F.; and Hanselman, Larry R., 3,891,774.

Miller, Wayne Russel; and Lucke, Robert James, Jr., to Deere & Company. Flow-sensing switch for backup steering system. 3,890,995, Cl. 137-113.000.

Millett, James A. Door lock assembly. 3,891,255, Cl. 292-169.130.

Millett, James A.: *See—*
Raymond, James W.; and Millett, James A., 3,890,815.

Milliken, Paul E., to Goodyear Tire & Rubber Company, The. Hay conditioner roll. 3,890,770, Cl. 56-1.000.

Mills, Justin W., Jr.; and Betzler, Mark H., to Lif-O-Gen, Inc. Cutting-welding torch. 3,891,195, Cl. 266-23.00P.

Mills, Robert H.; and Raube, Richard R., to Monsanto Company. Plasticizer purification. 3,891,694, Cl. 260-475.00B.

Miloscia, William J.; Weisz, John J.; and Planz, Paul E., to Standard Oil Company. Process for manufacture of impact-resistant polymerizates of olefinic nitriles and diene rubbers. 3,891,722, Cl. 260-879.000.

Milstein, Donald: *See—*
Oleck, Stephen M.; Stein, Thomas R.; Sherry, Howard S.; and Milstein, Donald, 3,891,541.

Minami, Nobuyoshi: *See—*
Suzuki, Yasushi; Itaya, Toshihisa; Minami, Nobuyoshi; Tarutani, Masaaki; Miki, Tokutaro; and Miyasaka, Katsuhiko, 3,891,664.

Mindlin, Raymond David: *See—*
Nagata, Takashi; and Mindlin, Raymond David, 3,891,872.

Minks, Floyd M., to Brunswick Corporation. Alternator driven capacitor power system. 3,890,948, Cl. 123-148.00E.

Minnesota Mining and Manufacturing Company: *See—*
Nelson, Norman E., 3,891,159.

Minolta Camera Kabushiki Kaisha: *See—*
Ueda, Hiroshi; and Kuramoto, Yoshio, 3,891,992.

Minovitch, Michael A. Microwave powered reusable orbiting space tug. 3,891,160, Cl. 244-1.0SS.

Mitiska, James L.: *See—*
Hertrick, Thomas P.; Mitiska, James L.; and Tobacman, Leo, 3,891,164.

Mitomo, Isamu; Kaji, Tetsunori; and Fukushima, Masakazu, to Hitachi, Ltd. Method for driving liquid cell display panel. 3,891,306, Cl. 350-160.0LC.

Mitsubishi Chemical Industries Ltd.: *See—*
Abe, Toshizo; Sakamoto, Seiho; Go, Shigeo; Maekuma, Koichi; Yamada, Yoshitaka; and Hirashima, Yasumasa, 3,891,611.
Kasugai, Hiroshi; Motojima, Shozo; and Inoue, Kazuhiko, 3,891,756.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Iijima, Katsuhiko; and Yoshida, Katsuhiko, 3,891,065.
Oka, Teruhiko; and Fujii, Masamichi, 3,891,501.

Mitsubishi Kenki Kabushiki Kaisha: *See—*
Shibagaki, Masao; and Oonishi, Masayoshi, 3,890,947.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Tsukamoto, Junya, 3,891,352.

Mitsubishi Seiko Kabushiki Kaishi: *See—*
Yamada, Keiko; Kamino, Kimiyuki; and Kubota, Toshiro, 3,891,879.

Mitsui Petrochemical Industry Ltd.: *See—*
Ninomiya, Tomokazu; and Hirata, Nobuhiro, 3,891,374.

Miyajima, Goh: *See—*
Tomita, Sadami; Chiba, Akio; and Miyajima, Goh, 3,891,475.

Miyake, Joji; and Nakakobara, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil seal means of a rotary piston engine. 3,891,361, Cl. 418-142.000.

Miyamoto, Koichi: *See—*
Katayama, Hajime; Miyamoto, Koichi; and Ohashi, Shoji, 3,890,721.

Miyasaka, Katsuhiko: *See—*
Suzuki, Yasushi; Itaya, Toshihisa; Minami, Nobuyoshi; Tarutani, Masaaki; Miki, Tokutaro; and Miyasaka, Katsuhiko, 3,891,664.

Miyauchi, Toshiyuki; and Ohtsuka, Kunio, to Nissan Jidosha Kabushiki Kaisha. Creep preventing hydraulic control circuit for vehicle automatic transmission. 3,890,856, Cl. 74-869.000.

Mobil Oil Corporation: *See—*
Cushman, Donald R.; and Schick, John W., 3,891,620.
Demmel, Edward J.; Nace, Donald M.; Owen, Hartley; and Rosinski, Edward J., 3,891,540.
Lee, Wooyoung, 3,891,836.
Oleck, Stephen M.; Stein, Thomas R.; Sherry, Howard S.; and Milstein, Donald, 3,891,541.

Moeser, Denis S. Seat mounting mechanism. 3,891,269, Cl. 297-252.000.

Mogensen, Palne; and Kaij, Mats J., to AGA Aktiebolag. Arrangement in a reactor for plasma-chemical processes. 3,891,562, Cl. 250-547.000.

Molyneux Engineering Company Limited: *See—*
Molyneux, George; and Molyneux, George Walter, 3,891,332.

Molyneux, George; and Molyneux, George Walter, to Molyneux Engineering Company Limited. Welded anchorage stud. 3,891,332, Cl. 403-13.000.

Molyneux, George Walter: *See—*
Molyneux, George; and Molyneux, George Walter, 3,891,332.

Monarch Marking Systems, Inc.: *See—*
Dobras, Bruce W., 3,891,829.

Monkovic, Ivo; Saucier, Michel; and Montzka, Thomas Alfred, to Bristol-Myers Company. 9Beta-hydroxy-5-methyl-6,7-benzomorphans. 3,891,657, Cl. 260-293.540.

Monsanto Company: *See—*
Mills, Robert H.; and Raube, Richard R., 3,891,694.
Preston, Jack, 3,891,693.

Montagne, Jean-Baptiste. Method of producing an apparatus for hydro-therapeutic treatment. 3,890,691, Cl. 29-423.000.

Montague, Donald J. Safety resilient slip coupling for pierced earrings. 3,890,800, Cl. 63-13.000.

Montanari, Sergio. Assembly type filing system comprising portfolios and filing cabinets therefor 3,891,070, Cl. 190-41.00R.

Montecatini Edison S.p.A.: *See—*
Ribaldone, Giuseppe; and Borsotti, Giampietro, 3,891,650.
Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto, 3,891,720.

Montzka, Thomas Alfred: *See—*
Monkovic, Ivo; Saucier, Michel; and Montzka, Thomas Alfred, 3,891,657.

Moody, Anthony Gifford; and Osmond, Desmond Wilfrid John, to Imperial Chemical Industries Limited. Production of stable dispersion of solid particles encapsulated in synthetic polymer. 3,891,572, Cl. 252-316.000.

Moog Automotive, Inc.: *See—*
Fister, Louis P.; and Paine, Robert, 3,890,958.

Moore, Charles H. Double plate welded outlet fitting and method of obtaining the same. 3,891,249, Cl. 285-189.000.

Moore, James C.: *See—*
Kirkpatrick, Burnard M.; and Moore, James C., 3,891,050.

Moore, William C.; Connors, John D.; and Newman, Richard W., to Welch Allyn, Inc. Disposable vaginal speculum. 3,890,961, Cl. 128-17.000.

Moorehead, Harvey Robert, to Deseret Pharmaceutical Co., Inc. Blood-gas sampler. 3,890,956, Cl. 128-2.00F.

Morane, Bruno; and Gueret, Jean Louis, to Societe Anonyne dite: L'Oreal. Device for storing two products separately and subsequently mixing them. 3,891,125, Cl. 222-129.000.

Morawska, Halina: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.

Morgan, John R.: *See—*
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,534.
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,542.

Morgan, John Trevor: *See—*
Blight, Dennis Jack; Miller, David Frederick; and Morgan, John Trevor, 3,891,292.

Mori, Kazuo: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 3,891,638.

Mori, Toshito: *See—*
Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,891,506.

Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; Maeda, Kihachiro; and Ishiguro, Toshihiro, to Takeda Chemical Industries, Ltd. Synthetic penicillins. 3,891,763, Cl. 424-271.000.

Morishita, Masataka: *See*—
Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, 3,891,570.

Morishita, Taneji: *See*—
Kimura, Yoshiaki; Kawai, Masanori; Yajima, Tatsuo; and Morishita, Taneji, 3,891,320.

Moriya, Nobuyoshi, to Mansei Kogyo Kabushiki Kaishya. Spark ignitable cigarette lighter. 3,891,381, Cl. 431-255.000.

Moriyama, Hideki; and Tachi, Seiichi, to Hitachi, Ltd. Method of manufacturing semiconductor device. 3,891,469, Cl. 148-1.500.

Morris, Horton Harold; Drexel, Richard Jacob, Jr.; and Turner, Kenneth Lamar, to Freeport Minerals Company. Reaction of fine media miller strach or protein with a polymer or polymerizable monomer. 3,891,580, Cl. 260-8.000.

Morrow, James G., Sr.: *See*—
Hunter, Charles A., II; Pech, David J.; and Morrow, James G., Sr., 3,891,264.

Morton-Norwich Products, Inc.: *See*—
Fiedelman, Howard W., 3,891,397.

Moser, James R., deceased: *See*—
Bowser, George C.; Moser, James R., deceased; and Moser, Patricia Karen, administratrix, 3,891,460.

Moser, Patricia Karen, administratrix: *See*—
Bowser, George C.; Moser, James R., deceased; and Moser, Patricia Karen, administratrix, 3,891,460.

Moskow, Eugene D. Fluid pressure regulator. 3,890,999, Cl. 137-505.250.

Moss, Norman; Martin, Barrie James; and Broad, Michael John, to Plessey Handel und Investments A.G. Heat exchange apparatus with gas chamber below heat exchange bed. 3,890,935, Cl. 122-4.00D.

Moss, Philip Hotchkiss: *See*—
Yeakey, Ernest Leon; and Moss, Philip Hotchkiss, 3,891,742.

Motojima, Shozo: *See*—
Kasugai, Hiroshi; Motojima, Shozo; and Inoue, Kazuhiko, 3,891,756.

Motoren-und Turbinen-Union Munich GmbH: *See*—
Hagemeister, Klaus; and Wiesbock, Josef, 3,890,780.

Motorola, Inc.: *See*—
Clark, Lowell E., 3,890,698.
Zwernemann, Ross, 3,891,479.

Mowrer, Ronald L.; Ebbler, Robert W.; and Gates, Major F., to Medental, Inc. Fluid delivery system for volatile fluids. 3,891,002, Cl. 137-557.000.

Muller, Alexander, to Hoxtersche Gummifadenfabrik Emil Arntz K.G. Apparatus for the continuous vulcanisation of endless belts. 3,891,364, Cl. 425-28.00B.

Muller, Pierre: *See*—
Joullie, Maurice L.; Maillard, Gabriel; Lakah, Lucien; and Muller, Pierre, 3,891,749.

Muller, Richard, to Gebr. Hofmann KG. Apparatus for determining imbalance in 120 degree spaced components and method of correcting said imbalance. 3,890,845, Cl. 73-462.000.

Muller, Rolf, to Papst-Motoren KG. Brushless d-c motor. 3,891,905, Cl. 318-254.000.

Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, to Kowa Company, Ltd. Antibiotic substance and process for its preparation. 3,891,506, Cl. 195-80.00R.

Munyon, Julian M.: *See*—
Smith, Fred T.; Munyon, Julian M.; and Gebhardt, James J., Jr., 3,891,338.

Murphy, Gregory I. Stereo accessory for projectors. 3,891,313, Cl. 353-8.000.

Murray, Edward J.; and Piggot, Andrew C. Ventable toaster package. 3,891,775, Cl. 426-107.000.

Musall, Reimar; and Wolsing, Wilhelm, to Kali-Chemie AG. Elastic holder for ceramic monolithic catalyst bodies. 3,891,396, Cl. 23-288.00F.

Musebeck, Horst: *See*—
Diepers, Heinrich; Musebeck, Horst; and Wirkner, Eduard, 3,890,700.

Musikindustriell Forskning MIFO AB: *See*—
Sjostrand, Gunnar O.; and Sjostrand, Staffan G., 3,890,872.

Muszumanski, Trude; Kurz, Gunter; and Wendisch, Irngard, to Vockenhuber, Karl; and Hauser, Raimund. Pancratic objective. 3,891,304, Cl. 350-184.000.

Muto, Eiji; Kawarabayashi, Tsuneo; Matsumura, Koichi; and Tamura, Hitoshi, to Japan Storage Battery Co., Ltd. Battery equipped with an indicator for the lowering of the electrolyte level. 3,891,465, Cl. 136-182.000.

Muzzy, Raymond J.: *See*—
Brown, Robert S.; and Muzzy, Raymond J., 3,891,482.

Myers, William A., III: *See*—
Novak, Leo J.; and Myers, William A., III, 3,891,780.

Naastepad, Pieter Aart, to U.S. Philips Corporation. Method of magnetizing a body of M_5R at high temperatures. 3,891,476, Cl. 148-103.000.

Nace, Donald M.: *See*—
Demmel, Edward J.; Nace, Donald M.; Owen, Hartley; and Rosinski, Edward J., 3,891,540.

Nadella: *See*—
Pitner, Alfred, 3,890,854.

Nadsady, Clarence A.; and Cannon, Clifford D., to E. B. Wiggins, Inc. Tubing coupling incorporating bridging conductor. 3,891,291, Cl. 339-15.000.

Naegeli, Werner, to Pavena AG. Method and apparatus for controlling a winding device for a continuously supplied fiber sliver. 3,891,155, Cl. 242-45.000.

Nagata, Takashi; and Mindlin, Raymond David, to Matsushita Electric Industrial Co., Ltd. Thickness-extensional mode piezoelectric resonator with poisson's ratio less than one-third. 3,891,872, Cl. 310-9.500.

Nagayama, Masuzo: *See*—
Isa, Hiroshi; Inagaki, Takeo; Kiyonaga, Yasuhiro; and Nagayama, Masuzo, 3,891,683.

Nahas, Nicholas C.; and Wilson, Edward L., to Exxon Research and Engineering Company. Transfer line burner system. 3,891,402, Cl. 48-197.00R.

Nakae, Hideo; and Goto, Akihiro, to Hitachi, Ltd. High toughness spheroidal graphite cast iron and method for producing the same. 3,891,432, Cl. 75-130.00R.

Nakakobara, Takeshi: *See*—
Miyake, Joji; and Nakakobara, Takeshi, 3,891,361.

Narayan, Thirumurti L.: *See*—
Cenker, Moses; and Narayan, Thirumurti L., 3,891,579.

Nash, Alan Richard Brine. Actuators. 3,890,885, Cl. 92-125.000.

National Advertising Company: *See*—
Schubert, Wilfried, 3,890,728.

National Rolling Mills Co.: *See*—
Jones, Paul H., 3,890,760.

National Starch and Chemical Corporation: *See*—
Ray-Chaudhuri, Dilip K.; Schoenberg, Jules E.; and Flanagan, Thomas P., 3,891,584.
Ray-Chaudhuri, Dilip K., 3,891,589.
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Nausedas, Joseph A., to Union Carbide Corporation. Product stuffing apparatus. 3,890,675, Cl. 17-41.000.

Neal, Francis John; and Simmons, John Richard, to Lucas Aerospace Limited. Torque transmitting device with torque limiting device. 3,890,803, Cl. 64-27.00B.

Needham, Donald G.; and Hill, George R., to Phillips Petroleum Company. Rotational molding of crosslinkable polymers. 3,891,597, Cl. 260-42.210.

Neeff, Rutger, to Bayer Aktiengesellschaft. Exhaust process for the dyeing of synthetic fibre materials. 3,891,388, Cl. 8-39.000.

Neises, Reuben J., to Stertz, Leroy F., a part interest. Bottle receiving apparatus. 3,891,080, Cl. 198-43.000.

Nelson, Gerald Verdell; and Wray, Glenn Cooper, to Texaco Inc. Hydrocracking process for converting heavy hydrocarbon into low sulfur gasoline. 3,891,539, Cl. 208-59.000.

Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Guide roller biasing shim liner. 3,891,159, Cl. 242-199.000.

Nelson, Roger P.: *See*—
Hess, Hans-Jurgen E.; and Nelson, Roger P., 3,891,750.

Neubauer, David J. Automatic head splitter. 3,890,673, Cl. 17-1.00A.

New, Michael: *See*—
Bennett, John P.; Bliss, George D.; and New, Michael, 3,891,555.

New York University: *See*—
Youdin, Myron; Barker, June N.; and Reich, Theobald, 3,890,959.

New Zealand Dairy Research Institute: *See*—
Robertson, Peter Struan; and Bysouth, Raymond, 3,891,783.

Newberry, Meigs, to General Instrument Corporation. UHF tuner stop mechanism. 3,890,849, Cl. 74-10.200.

Newby, Gordon L. Molding apparatus and chopper for forming rubber slugs. 3,891,373, Cl. 425-301.000.

Newman, Jacob. Adjustable ring-shaped articles of jewelery. 3,890,801, Cl. 63-15.650.

Newman, Richard W.: *See*—
Moore, William C.; Connors, John D.; and Newman, Richard W., 3,890,961.

Newson, John Chase, to Westinghouse Brake & Signal Co. Ltd. Door operating controls. 3,891,909, Cl. 318-469.000.

Nichols, George V., to Whirlpool Corporation. Broken belt switch control system for clothes dryer. 3,890,720, Cl. 34-55.000.

Nichols-Homeshield, Inc.: *See*—
Johnson, Morris E.; and Princ, Josef, 3,891,256.

Nick, Charles F.; and Davidson, Morris J., to Dresser Industries, Inc. Engine torque monitoring system. 3,890,832, Cl. 73-116.000.

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Nippon Electric Company, Limited: *See*—
Kohara, Haruki, 3,891,978.
Nishida, Nobuo, 3,891,436.

Nippon Kogei Kogyo Company, Limited: *See*—
Watanabe, Tamotsu, 3,891,415.

Nippon Kokan Kabushiki Kaisha: *See—*
Horioka, Masaki, 3,890,697.
Nippon Soken, Inc.: *See—*
Akita, Sigeyuki, 3,891,914.
Nippondenso Co., Ltd.: *See—*
Oishi, Kazuo; Ando, Noriyoshi; and Yoshida, Hiroshi, 3,890,938.
Nischk, Gunther: *See—*
Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 3,891,718.
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Kawai, Taneichi; and Nishida, Koji, 3,890,734.
Nishida, Nobuo, to Nippon Electric Company, Limited. Bleached phase holograms and method of producing the same. 3,891,436, Cl. 96-27.00H.
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Nixdorf Computer AG: *See—*
Pollmeier, Werner, 3,891,904.
Nobbs, Douglas C.: *See—*
Bricker, Francis G.; Isaacs, Jack L.; and Nobbs, Douglas C., 3,891,170.
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Noguera, John Michael. Fiber drafting apparatus. 3,890,677, Cl. 19-255.000.
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Downing, Todd R.; and Nolen, Robert K., 3,891,176.
Nomura, Hiroaki: *See—*
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; Maeda, Kihachiro; and Ishiguro, Toshihiro, 3,891,763.
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Winter, Richard M.; and Aylard, William F., 3,891,952.
Noranda Mines Limited: *See—*
Gervais, Edouard; Levert, Henri; and Chollet, Pierre, 3,891,024.
Norbut, Theodore J. Turbine disc. 3,891,351, Cl. 416-219.000.
Nordblom, George F., to ESB Incorporated. Bath for plating gold on titanium metal. 3,891,447, Cl. 106-1.000.
Nordenholt, George F. Sealant applying apparatus. 3,890,922, Cl. 118-7.000.
Norland Gazelle Travel Goods Limited: *See—*
Elsas, Tibor, 3,891,245.
North, John Malcolm; and Wilks, Ronald Spencer, to United Kingdom Atomic Energy Authority. Sintered artefacts and the like. 3,891,735, Cl. 264-59.000.
Northeast Electronics Corporation: *See—*
Bartelink, Everhard H. B., 3,891,802.
Northern Electric Company Limited: *See—*
Mikhael, Wasfy Boushra; and Keys, Lloyd Kenneth, 3,891,938.
Norton, Charles J.; and Falk, David O., to Marathon Oil Company. Carboxy vinyl polymer and partially hydrolyzed polyacrylamide mobility control agent and process. 3,891,567, Cl. 252-8.55D.
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Rowse, Robert A.; and Watson, George R., 3,891,408.
Norton, David E.; and Podell, Allen F., to Adams-Russell Co., Inc. Transistor amplifier with impedance matching transformer. 3,891,934, Cl. 330-21.000.
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Knappe, Heinrich; Notle, Karl Heinz; and Kempelmann, Reinhold, 3,891,129.
Nougaret, Marcel; and Belmonte, Jean-Claude, to Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM). Control system for switching element. 3,891,931, Cl. 328-127.000.
Novak, Leo J.; and Myers, William A., III. Crustacean waste water product recovery process. 3,891,780, Cl. 426-657.000.
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Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.
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Hackstein, Karl-Gerhard; and Hrovat, Milan, 3,891,502.
Nunez, Daniel. Motion simulator. 3,890,722, Cl. 35-12.00P.
Oberheim Electronics Inc.: *See—*
Oberheim, Thomas E., 3,890,871.
Oberheim, Thomas E., to Oberheim Electronics Inc. Apparatus for storing sequences of musical notes. 3,890,871, Cl. 84-1.010.
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Galecki, Glenn E.; and Oberson, Sonia R., 3,891,747.
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Munakata, Katsura; Oda, Takeshi; Mori, Toshito; and Ito, Hisakatu, 3,891,506.
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Odle, Ralph S., Jr.: *See—*
Braga, Albert T.; Brenner, Robert A.; and Odle, Ralph S., Jr., 3,890,719.
Oehler, Horst: *See—*
Braun, Otto Paul; and Oehler, Horst, 3,891,979.
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Offermann, Bernd Peter, to Licentia-Patent-Verwaltungs-GmbH. High energy electron irradiation of flowable materials. 3,891,855, Cl. 250-492.000.
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Kobayashi, Yasunobu; and Ogawa, Hikaru, 3,890,864.
Ohashi, Shoji: *See—*
Katayama, Hajime; Miyamoto, Koichi; and Ohashi, Shoji, 3,890,721.
Ohnaka, Kouichi: *See—*
Higuchi, Masaru; and Ohnaka, Kouichi, 3,891,709.
Ohta, Katsuichi: *See—*
Yasumori, Akiyoshi; Ohta, Katsuichi; Kunikane, Makoto; and Abe, Michiharu, 3,891,513.
Ohtani, Hiroyoshi: *See—*
Takenouchi, Senji; Yanai, Tautomu; Matsumoto, Takamasa; and Ohtani, Hiroyoshi, 3,891,051.
Ohtsuka, Kunio: *See—*
Miyauchi, Toshiyuki; and Ohtsuka, Kunio, 3,890,856.
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Tsukamoto, Masahide; and Ohtsuka, Tetsuro, 3,891,307.
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Richardson, Murl R., 3,890,665.
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Arai, Atsuaki; and Oishi, Yasushi, 3,891,445.
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Okada, Yoshiyuki: *See—*
Wakae, Osamu; Yakushiji, Kunito; and Okada, Yoshiyuki, 3,891,762.
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Kato, Teiji; and Okamoto, Katsumi, 3,891,499.
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Okazaki, Hiroyuki; Yuji, Isao; and Yui, Masayuki, to Sumitomo Chemical Co., Ltd. Thermoplastic traffic paint. 3,891,451, Cl. 106-30.000.
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Calcagno, Kenneth H., 3,891,015.
Galecki, Glenn E.; and Oberson, Sonia R., 3,891,747.
Oliver Machinery Company: *See—*
Davies, John R., 3,891,324.
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Ernst, Horst; Brandenstein, Manfred; and Olschewski, Armin, 3,891,284.
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Olson, Carroll G. Wagon with elongate conveyor housing as unloader and drayage hitch. 3,891,109, Cl. 214-519.000.
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Ondetti, Miguel Angel, to E. R. Squibb & Sons, Inc. Hypotensive β-homoaminoacid nonapeptides. 3,891,616, Cl. 260-112.500.
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Wilhelm, Max G.; Manning, William Truman; and O'Neil, James D., 3,891,782.
Ono, Taiichi. Waste paper container. 3,891,115, Cl. 220-260.000.
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Shibagaki, Masao; and Oonishi, Masayoshi, 3,890,947.
Opdahl, Everett W.; and Kim, Chang-Kyo, to United States of America, Navy. External launcher for underwater weapon. 3,890,919, Cl. 114-239.000.
Orsulak, Joseph. Safety shield and compartmentizer. 3,891,263, Cl. 296-24.00R.
Orthokinetics, Inc.: *See—*
Gaffney, Edward J., 3,891,229.
Ortiz, Carlos Mayer. Sealing means for deep-well. 3,891,031, Cl. 166-68.500.
Osawa, Akira: *See—*
Yasuda, Isao; and Osawa, Akira, 3,891,890.
Osmond, Desmond Wilfrid John: *See—*
Moody, Anthony Gifford; and Osmond, Desmond Wilfrid John, 3,891,572.
Ossig, Horst: *See—*
Stawicky, Wolfgang; and Ossig, Horst, 3,891,426.

Ostensen, Ralph G.: *See—*
Bazell, Seymour; Ostensen, Ralph G.; and Goldberg, Edward M., 3,890,976.

Otten, Hans-Gunter: *See—*
Sommer, Richard; Wiesel, Manfred; Otten, Hans-Gunter; and Siegel, Edgar, 3,891,619.

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Smitherman, Chester L., Jr.; Overcashier, Robert H.; and Kruka, Vitold R., 3,891,593.

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Schuster, Samuel R.; and Kopito, Louis, 3,891,325.

Owen, Harrold D.; and Terrell, Jamie B., to Gearhart-Owen Industries, Inc. Through-tubing bridge plug having covered expansible packer. 3,891,034, Cl. 166-285.000.

Owen, Hartley: *See—*
Demmel, Edward J.; Nace, Donald M.; Owen, Hartley; and Rosinski, Edward J., 3,891,540.

Owens-Corning Fiberglas Corporation: *See—*
Froberg, Magnus L.; and Jackson, Robert F., 3,891,422.
Roberson, Cletis L.; Russell, Robert G.; Stream, Ralph M.; and Leaman, Harold E., 3,890,925.
Roberts, Michael G.; and Matuszak, Michael L., 3,891,596.

Owens-Illinois, Inc.: *See—*
Simmons, George A., 3,891,419.
Trease, Ralph E., 3,891,450.

Oxy Metal Industries (Intra) Inc.: *See—*
Richardson, John L.; Brodie, Alexander O.; and Lewis, Clarke H., 3,891,556.

P. R. Mallory & Co. Inc.: *See—*
Booe, James M.; and Landry, Lawrence A., 3,891,901.

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Meador, Richard A.; Arnold, Richard H.; and Paap, Hans J., 3,891,916.

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Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto, 3,891,720.

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Fister, Louis P.; and Paine, Robert, 3,890,958.

Palmer, Harold A.; and Sample, Thomas E., Jr., to Texaco Inc. Oxyalkylated quinolines. 3,891,655, Cl. 260-289.00R.

Pancella, Vincent A. Hydraulic transmission motor vehicle. 3,891,045, Cl. 180-66.00R.

Papst-Motoren KG: *See—*
Muller, Rolf, 3,891,905.

Paranto, Archie V., to Barco International Corporation of Texas. Automatic fluid dispersing apparatus. 3,891,122, Cl. 222-17.000.

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Parkin, William J., to Sanders Associates, Inc. Photosensitive tracker including means for producing an output in accordance with a plurality of radiation characteristics. 3,891,843, Cl. 250-203.00R.

Parsonage, Harry N.: *See—*
Jensen, Gerald A.; and Parsonage, Harry N., 3,891,532.

Parsons, David: *See—*
Bainbridge, Wilfred Nicholas; and Parsons, David, 3,891,241.

Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See—*
Wurster, Ewald, 3,891,885.

Patrick Harrison & Company Limited: *See—*
Rousseau, Gilles, 3,891,148.

Patterson, Irvin L., to Telex Computer Products, Inc. Liquid damped galvanometer. 3,891,921, Cl. 324-125.000.

Patterson, John W. Kinestherapy device. 3,890,963, Cl. 128-24.100.

Paul Forkardt Kommanditgesellshcaft: *See—*
Scharfen, Hans; Schmitz, Karl Heinz; Strerath, Theo; and Jenko, Dragutin, 3,891,058.

Paul, Herman L., Jr. Rotary energy converter. 3,890,941, Cl. 123-44.00R.

Paul Hettisch & Co.: *See—*
Sewing, Gerhard; and Bachor, Jurgen, 3,890,670.

Paulson, Peter C.; Henderson, Henri H.; and Worstell, Richard L., to Electro-Coatings, Inc. Method for plating aircraft cylinders. 3,891,515, Cl. 204-26.000.

Pavena AG: *See—*
Naegeli, Werner, 3,891,155.

Pech, David J.: *See—*
Hunter, Charles A., II; Pech, David J.; and Morrow, James G., Sr., 3,891,264.

Pechiney Ugine Kuhlmann: *See—*
Sailer, Andre Louis; and Frank, Pierre, 3,891,617.

Pedler, Richard C. Furniture. 3,890,660, Cl. 5-101.000.

Peet, Jon, to Precisa AG, Rechenmaschinenfabrik. Pressure measuring apparatus. 3,890,833, Cl. 73-141.00A.

Peilstocker, Gunter: *See—*
Schirmer, Hermann; Peilstocker, Gunter; and Schuster, Herbert, 3,891,719.

Peirce, Benjamin F., Jr. Tool for pulling a line through a conduit. 3,891,188, Cl. 254-134.30R.

Pelin, Charles. Automatic route information display. 3,891,243, Cl. 283-35.000.

Pennie, Walter L.: *See—*
Sundie, Richard D.; and Pennie, Walter L., 3,891,590.

Penninger, William. Storm-lightning detector. 3,891,919, Cl. 324-72.000.

Penny, Robert Noel. Regenerative heat exchanger. 3,891,028, Cl. 165-6.000.

Perfection Corporation: *See—*
Alewitz, Sam, 3,891,530.

Perry, L. F., Jr., to Century Industries, Inc. Mobile apparatus to mix and deliver concrete compositions or the like. 3,891,193, Cl. 259-165.000.

Perry, Robert H., to Westinghouse Electric Corporation. Vehicle presence detection in a vehicle control system. 3,891,167, Cl. 246-34.00R.

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Severinsson, Lars Mattis; and Persson, Gert Artur, 3,891,280.

Persson, John A., to Lectromelt Corporation. Method for melting prereduced ore and scrap. 3,891,427, Cl. 75-12.000.

Petersen, Harro; Erhard, Paulus; Queins, Hubertus; and Schoeppl, Hubert, to BASF Aktiengesellschaft. Rubber mixtures showing improved surface tack. 3,891,608, Cl. 260-80.780.

Petersen, Kaj Ditlev Frederik: *See—*
Drostholm, Frede Hilmar; Petersen, Kaj Ditlev Frederik; and Raabo, Ulf, 3,891,510.

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Peterson, Warren J., to Joerns Furniture Company. Vertically adjustable overbed table. 3,890,907, Cl. 108-136.000.

Peterson, William H., to Pullman Incorporated. Hopper car door closure improvement. 3,891,101, Cl. 214-63.000.

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Petrusson, Erling Olav Valdemar, to AB Teleplan. Method and device for determining the existence and the time position of main peaks appearing in an electronic signal. 3,891,930, Cl. 328-117.000.

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Willich, Jean Herbert; and Pfeil, Christian, 3,891,199.

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Pfizer Inc.: *See—*
Hess, Hans-Jurgen E.; and Nelson, Roger P., 3,891,750.
Lombardino, Joseph G., 3,891,637.
McFarland, James W., 3,891,698.
Rosati, Robert L., 3,891,627.

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Phillipps, Gordon Hanley; Bain, Brian MacDonald; and Durrant, Graham, to Glaxo Laboratories Limited. Process for preparing 17α-monoesters of 17α, 21-dihydroxy-20-oxo steroids. 3,891,631, Cl. 260-239.55R.

Phillips, Alvia E.: *See—*
McInerney, Michael J.; Brady, Robert T.; and Phillips, Alvia E., 3,890,936.

Phillips, Geoffrey John; and Chambers, John Philip, to Marconi Company Limited, The; and Standard Telephones & Cables Limited. Colour television. 3,891,994, Cl. 358-11.000.

Phillips Petroleum Company: *See—*
Farfaglia, Silvio T.; Coburn, Leslie O.; Halpin, Robert G.; and Bock, Ronald E., 3,890,765.
Needham, Donald G.; and Hill, George R., 3,891,597.
Rushford, Wilson H., 3,891,366.

Phillips, Ralph E., Jr.: *See—*
Sadler, Keith A.; and Phillips, Ralph E., Jr., 3,891,144.

Picard, Salvatore R.; and Starry, Robert F., to United States of America, Navy. Intrusion detector. 3,891,865, Cl. 307-232.000.

Picker Corporation: *See—*
Amor, William H., Jr.; and Stancliff, Robert E., 3,891,856.
Hura, Michael, 3,891,854.

Picker X-Ray Mfg. Limited: *See—*
Bridgeman, Cecil K., 3,891,850.

Pickett, William H.: *See—*
Caputo, Arnold P.; Anthony, David W.; and Pickett, William H., 3,890,751.

Pickler, Lloyd P. Insulation cutter. 3,890,868, Cl. 83-408.000.

Pieper, Wolfgang: *See—*
Hecht, Gert; Schoning, Rudolf; and Pieper, Wolfgang, 3,891,355.

Pierce, Oscar L.; Hutchison, Arthur H.; King, Olin B.; and McMillian, Lonnie S., to SCI Systems, Inc. Fluid flow control means. 3,890,968, Cl. 128-214.00E.

Pifferi, Giorgio, to I. S. F. S.p.A. 3-Aminoalcoxy-6-hydrazino pyridazines. 3,891,641, Cl. 260-250.00A.

Pigeaud, Jean-Marie: *See—*
Bouy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, 3,891,531.

Piggot, Andrew C.: *See—*
Murray, Edward J.; and Piggot, Andrew C., 3,891,775.

Pignone, Edward H.: *See—*
Johnson, Quentin S.; and Pignone, Edward H., 3,891,795.

Pilch, John S., to Ware Machine Service, Inc. Swing mechanism for earth-moving apparatus. 3,891,104, Cl. 214-132.000.

Pilet, Charles; and Bonneau, Marc, to Institut Merieux. Vaccines and processes for their preparation. 3,891,751, Cl. 424-87.000.

Pilewski, John J.; Plotz, Lawrence F.; and Pruisman, Richard A., to Vector Corporation. Tablet press. 3,891,375, Cl. 425-344.000.

Pillsbury Company, The: *See—*
Wilhelm, Max G.; Manning, William Truman; and O'Neil, James D., 3,891,782.
Pineur, Gilbert. Device facilitating the positioning of a pipe coupling. 3,890,694, Cl. 29-450.000.
Pisarik, Walter: *See—*
Tummers, Josef; and Pisarik, Walter, 3,890,916.
Pitner, Alfred, to Nadella, a part interest. Rolling bearing assembly, in particular for a steering shaft of an automobile vehicle. 3,890,854, Cl. 74-492.000.
Pittet, Alan Owen: *See—*
Vinals, Joaquin Francisco; Quinn, Alton Dewitt; and Pittet, Alan Owen, 3,890,981.
Pivit, Erich: *See—*
Marquardt, Jurgen; and Pivit, Erich, 3,891,949.
Planz, Paul E.: *See—*
Miloscia, William J.; Weisz, John J.; and Planz, Paul E., 3,891,722.
Plass, Reinhold: *See—*
Danneil, Axel; Flickinger, Erich; Graefje, Heinz; Plass, Reinhold; and Schnur, Rudolf, 3,891,511.
Plasti-Mac, Inc.: *See—*
Sokolow, Nicholas N., 3,891,371.
Plasticrete Corporation: *See—*
Caputo, Arnold P.; Anthony, David W.; and Pickett, William H., 3,890,751.
Plat, Michel Marie Rene; Plat, Monique, nee Berry; Cahn, Jean; and Tisseyre, Pierre Georges Christian, to Synthelabo. Apovincaminic acid amines and acid addition salts thereof. 3,891,640, Cl. 260-247.5FP.
Plat, Monique, nee Berry: *See—*
Plat, Michel Marie Rene; Plat, Monique, nee Berry; Cahn, Jean; and Tisseyre, Pierre Georges Christian, 3,891,640.
Platinum Pen Co., Ltd.: *See—*
Kato, Kazue, 3,891,329.
Plessey Handel und Investments A.G.: *See—*
Moss, Norman; Martin, Barrie James; and Broad, Michael John, 3,890,935.
Plessey Incorporated: *See—*
Frazee, Lawrence E.; and Fraioli, Anthony V., 3,890,703.
Pleva, Harry, to Werner & Pfleiderer. Device for measuring the humidity of gaseous substances. 3,890,828, Cl. 73-29.000.
Plotz, Lawrence F.: *See—*
Pilewski, John J.; Plotz, Lawrence F.; and Pruisman, Richard A., 3,891,375.
Plummer, Walter A.: *See—*
Maurer, John R., 3,890,795.
Plundrich, Winfried: *See—*
Dotzer, Richard; and Plundrich, Winfried, 3,890,835.
Podell, Allen F.: *See—*
Norton, David E.; and Podell, Allen F., 3,891,934.
Polgar, Livia: *See—*
Kershaw, Robert William; Lubbock, Frederick John; and Polgar, Livia, 3,891,577.
Poliak, John M.; and Lopez, Juan M., to Leviton Manufacturing Co., Inc. Electrical connector for attachment to multi-conductor cable. 3,891,297, Cl. 339-270.00R.
Pollmeier, Werner, to Nixdorf Computer AG. Methods and circuit arrangements for smoothing pulsating voltages. 3,891,904, Cl. 318-254.000.
Polychrome Corporation: *See—*
Chu, Simon L., 3,891,516.
Halpern, Gregory; and Rowe, William, 3,891,443.
Katz, Leon; and Golda, Eugene, 3,891,438.
Katz, Leon; Rowe, William; and Golda, Eugene, 3,891,439.
Ponomarenko, Nikolai Borisovich: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.
Porowska, Natalia: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.
Porras, Ruben J. Torque sensing device. 3,891,908, Cl. 318-434.000.
Porter, Edward S.: *See—*
Lawall, Thomas R.; and Porter, Edward S., 3,891,382.
Poster Products, Inc.: *See—*
Stanish, Robert B., 3,890,777.
Poteate, Wilmer B.: *See—*
United States of America, National Aeronautics and Space Administration; Hunt, Stacy R., Jr.; Homkes, Robert J.; Poteate, Wilmer B.; and Sturgis, Andrew C., 3,891,311.
Poulos, Gus L. Single leaf spring. 3,891,197, Cl. 267-47.000.
Powers, Raymond P.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P., 3,890,772.
PPG Industries, Inc.: *See—*
Carlin, William W., 3,891,521.
Carlin, William W.; Darlington, William B.; and Dubois, Donald W., 3,891,741.
Frank, Robert G., 3,891,420.
Irwin, James; and Erikson, J. Alden, 3,891,525.
Pracilio, Francis Paul, to Educational Machinery Corporation. Apparatus for teaching vacuum forming and pressure forming. 3,891,369, Cl. 425-174.000.
Prahl, Jan, to Ipos Gesellschaft fur Integrierte Prothesenentwicklung und Orthopadietechnischen Service m.b.H. & Co. K.G. Artificial foot for leg prostheses. 3,890,650, Cl. 3-7.000.
Pratt, Winthrop B.: *See—*
Davis, Robert C.; and Pratt, Winthrop B., 3,891,357.
Precisa AG, Rechenmaschinenfabrik: *See—*
Peer, Jon, 3,890,833.
Preston, Jack, to Monsanto Company. Method for making alkylene-bis(nitrobenzoate)s. 3,891,693, Cl. 260-471.00R.
Price, William R.: *See—*
Conner, Charles C.; and Price, William R., 3,891,932.
Princ, Josef: *See—*
Johnson, Morris E.; and Princ, Josef, 3,891,256.
Pringle, Ronald E.: *See—*
Tausch, Gilbert H.; and Pringle, Ronald E., 3,891,032.
Prior, William C.; and Kewley, James W. Control valve for water softeners. 3,891,552, Cl. 210-88.000.
Pritchard, Gethyn James, to Girling Limited. Lined brake shoes. 3,891,825, Cl. 219-243.000.
Pro-Tech Inc.: *See—*
Irwin, Malcolm F., 3,890,843.
Probe Rite, Inc.: *See—*
Ardezzone, Frank J.; and Englert, Thomas A., 3,891,924.
Procter & Gamble Company: *See—*
Broaddus, Charles David; and Robbins, Medford Dwight, 3,891,672.
Prodanov, Velcho Angelov: *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.
Prudence, Robert T., to Goodyear Tire & Rubber Company, The. Block polymers of styrene-butadiene-2-vinylpyridine. 3,891,721, Cl. 260-879.000.
Pruisman, Richard A.: *See—*
Pilewski, John J.; Plotz, Lawrence F.; and Pruisman, Richard A., 3,891,375.
Pruvot, Francois C., to Regie Nationale des Usines Renault; and Automobiles Peugeot. Self-feeding hydrostatic. 3,891,283, Cl. 308-5.00R.
Pryce, Alan, to Lever Brothers Company. Continuous sulphonation process. 3,891,689, Cl. 260-458.000.
Psychotherapeutic Devices, Inc.: *See—*
Kritzberg, Nathan I., 3,891,209.
Pullen, Eric V.: *See—*
Manoogian, Alex; and Pullen, Eric V., 3,891,005.
Pullman Incorporated: *See—*
Peterson, William H., 3,891,101.
Punwani, Dharamvir: *See—*
Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,403.
Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,404.
Purdue Research Foundation: *See—*
Sallay, Stephen I., 3,891,658.
Purification Sciences Inc.: *See—*
Lowther, Frank E., 3,891,561.
Putnam, David F.: *See—*
United States of America, National Aeronautics and Space Administration; Putnam, David F.; and Vaughan, Richard L., 3,891,533.
Quaker Oats Company, The: *See—*
Gilbert, Eugene C.; Jones, Robert E.; and Sherman, Edward, 3,891,717.
Queins, Hubertus: *See—*
Petersen, Harro; Erhard, Paulus; Queins, Hubertus; and Schoeppl, Hubert, 3,891,608.
Quindar Electronics, Inc.: *See—*
Wang, Kuei-Seng, 3,891,801.
Quinn, Alton Dewitt: *See—*
Vinals, Joaquin Francisco; Quinn, Alton Dewitt; and Pittet, Alan Owen, 3,890,981.
Quintero, Eduardo: *See—*
Fernandez, Alberto; and Quintero, Eduardo, 3,891,127.
Raabo, Ulf: *See—*
Drostholm, Frede Hilmar; Petersen, Kaj Ditlev Frederik; and Raabo, Ulf, 3,891,510.
Radu, Stefan I., to Intreprinderea Mecanica de Utilaje Medcidia. Method and a device for reducing the pipe diameter. 3,890,823, Cl. 72-402.000.
Ralston Purina Company: *See—*
Baker, Richard J.; Miller, Timothy A.; Erlinger, Gary K.; Loepiktie, Stephanus F.; and Hanselman, Larry R., 3,891,774.
Boyer, Robert Allan, 3,891,777.
Boyer, Robert Allan, 3,891,778.
Rambaud, Jerome: *See—*
Coirre, Paul; Coirre, Bertrand; Denis, Jean-Claude; Rambaud, Jerome; and Cahn, Jean, 3,891,765.
Ramirez, Daniel M.: *See—*
Diggins, Dennis R., 3,890,649.
Ramsey, Harold Eugene, to du Pont de Nemours, E. I., and Company. Vacuum skin packaging method. 3,890,761, Cl. 53-22.00A.

Ramsey, Maynard, III, to Ramtech, Inc. Disposable manometer. 3,890,842, Cl. 73-420.000.
Ramsey, Maynard, III, to Ramtech, Inc. Disposable manometer. 3,890,962, Cl. 128-2.05D.
Ramtech, Inc.: *See—*
Ramsey, Maynard, III, 3,890,842.
Ramsey, Maynard, III, 3,890,962.
Rao, Ganta V.; and Gerrish, Oliver B., Sr., to Far-Mar-Co., Inc. Process for separation of whole wheat kernel components to isolate the gluten employing water. 3,891,613, Cl. 260-112.00G.
Rao, Hattangady Vasanth; and Doss, Ravindra Nath. Inverter. 3,891,913, Cl. 321-45.00R.
Rapson, John Edward, to Hovercraft Development Limited. Skirts of gas cushion vehicles. 3,891,047, Cl. 180-117.000.
Rast, Howard E.; and Caspers, Hubert H., to United States of America, Navy. Dye laser transmitter-resonant fluorescent detector system for optical communications. 3,891,559, Cl. 250-199.000.
Raube, Richard R.: *See—*
Mills, Robert H.; and Raube, Richard R., 3,891,694.
Ray-Chaudhuri, Dilip K.; Schoenberg, Jules E.; and Flanagan, Thomas P., to National Starch and Chemical Corporation. Water-dispersible hot melt adhesives and products using same. 3,891,584, Cl. 260-27.00R.
Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Process for preparing stable high solids aqueous solution of cationic thermosetting resins. 3,891,589, Cl. 260-29.2EP.
Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Stockmann, Hans H., to National Starch and Chemical Corporation. Bromine-containing esters. 3,891,695, Cl. 260-475.00N.
Raychem Corporation: *See—*
Humphries, William H., 3,891,490.
Raymond, James W.; and Millett, James A. Lock assembly. 3,890,815, Cl. 70-363.000.
Raytheon Company: *See—*
Tisdale, Lawrence H., 3,891,884.
RCA Corporation: *See—*
Bohringer, Walter, 3,891,892.
Ladany, Ivan; and Cannuli, Vincent Michael, 3,891,478.
Limberg, Allen Leroy, 3,891,935.
Stark, John, Jr., 3,891,891.
Wittlinger, Harold Allen, 3,891,895.
Woontner, Leo, 3,891,886.
Rebsdat, Siegfried: *See—*
Benninger, Siegfried; and Rebsdat, Siegfried, 3,891,625.
Recherche Pharmaceutiques et Scientifiques: *See—*
Joullie, Maurice L.; Maillard, Gabriel; Lakah, Lucien; and Muller, Pierre, 3,891,749.
Red Ant Products, Inc.: *See—*
Chandler, Roy L., 3,891,132.
Rederiaktiebolaget Nordstjernan: *See—*
Carmel, Amichai Meir; and Lundh, Bengt Olov, 3,891,549.
Redling, Anthony E. Mailbox apparatus. 3,891,139, Cl. 232-35.000.
Redmond, Stephen L.: *See—*
Anderson, Matthew E.; and Redmond, Stephen L., 3,890,901.
Reenskoug, Hans Ivar. Fully automatic torque responsive planetary gearbox with plural countershafts. 3,890,855, Cl. 74-730.000.
Reflect-O-Lite Manufacturing Company: *See—*
Salg, George, 3,891,113.
Regan, Patrick E.: *See—*
Harris, James E.; and Regan, Patrick E., 3,891,103.
Regie Nationale des Usines Renault: *See—*
Haurat, Edouard; and Bouclet, Roland, 3,890,723.
Pruvot, Francois C., 3,891,283.
Reich, Theobald: *See—*
Youdin, Myron; Barker, June N.; and Reich, Theobald, 3,890,959.
Reichel, Eckehart: *See—*
Rometsch, Werner; Robeller, Walter; Lutz, Gerhard; Reichel, Eckehart; Bosch, Paul; and Vohringer, Gerd, 3,890,883.
Reichrath, Werner: *See—*
Suverkropp, Geertrudes H.; and Reichrath, Werner, 3,891,702.
Reid, James P., Jr.; and McConnell, Bobby L., to Burlington Industries, Inc. Process for continuously treating spunlaced nonwoven polyester textiles on a tenter frame. 3,891,386, Cl. 8-18.000.
Reid, John D.: *See—*
Verburg, Gerald B.; Frick, John G., Jr.; and Reid, John D., 3,891,389.
Reihle, Markus; and Harsch, Erich, to Maschinenfabrik Weingarten AG. Stamping machine for slotting core plates. 3,890,863, Cl. 83-71.000.
Reinertsen, Tormod K.: *See—*
Cooper, Julius; and Reinertsen, Tormod K., 3,891,213.
Reinfeld, Kurt; and Gouye, Emmanuel V., to Koppers Company, Inc. Apparatus for bending continuous cast slabs. 3,891,026, Cl. 164-282.000.
Reinforced Shuttlecocks Limited: *See—*
Maconachie, Ian Christy, 3,891,215.
Reinhards, Gunter, to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie. Lockable castor, in particular swivel castor. 3,890,669, Cl. 16-35.000.
Reinhards, Gunter: *See—*
Stosberg, Herbert; Fleishmann, Horst; Reinhards, Gunter; and Engels, Siegfried, 3,890,668.
Reliance Electric Company: *See—*
Hall, Donivan L.; and Kupper, Walter E., 3,891,041.
Remington Arms Company, Inc.: *See—*
Eckstein, George R., 3,890,682.
Rendemonti, Louis. Method and apparatus for simultaneously deodorizing and disinfecting the interiors of vehicles. 3,891,149, Cl. 239-70.000.
Renner, Hermann: *See—*
Wilfert, Karl; Barenyi, Bela; and Renner, Hermann, 3,891,266.
Renold, Adolph, to Colgate-Palmolive Company. Softergent composition containing n-alkyl-1,3-propylene diamine. 3,891,563, Cl. 252-8.800.
Resch, Richard Jerome: *See—*
Crossman, Philip Edgar; and Resch, Richard Jerome, 3,891,270.
Reschly, Richard L.: *See—*
Snoberger, Robert C.; Delker, Thomas C.; and Reschly, Richard L., 3,891,231.
Research Products/Incinolet Corporation: *See—*
Blankenship, Ernest Bayne, 3,890,653.
Blankenship, Ernest Bayne, 3,890,654.
Revell, Alan E., to American Air Filter Company, Inc. Door handle and latch device. 3,891,253, Cl. 292-59.000.
Rexham Corporation: *See—*
Goodwin, Charles C.; Rounsaville, David L.; and Grimm, James H., 3,891,089.
Rexnord Inc.: *See—*
Trainor, Maurice J.; and Riddle, Charles F., 3,891,341.
Reynolds Metals Company: *See—*
Marsh, Alexander J.; and Sargent, Henry O., 3,891,737.
Rheinstahl AG: *See—*
Koppers, Manfred; and Kuhnapfel, Friedhelm, 3,890,793.
Rhinehart, Vance E.; and Yother, Floyd G., to Cumberland Corporation. Carrier. 3,891,228, Cl. 280-36.00R.
Rhone-Poulenc-Textile: *See—*
Auriat, Edouard; and Gaudard, Yves, 3,890,802.
Rhone-Progil: *See—*
Bouy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, 3,891,531.
Chauvel, Bernard; and Daniel, Jean-Claude, 3,891,592.
Rhoton, Richard S.; and McDonald, Michael P., to Westinghouse Electric Corporation. Vehicle coast control system. 3,891,833, Cl. 235-150.200.
Riat, Henri: *See—*
De Montmollin, Rene; and Riat, Henri, 3,891,618.
Ribaldone, Giuseppe; and Borsotti, Giampietro, to Montecatini Edison S.p.A. Process for preparing anthraquinone-1-acetic acid and esters thereof. 3,891,650, Cl. 260-376.000.
Richardson, John L.; Brodie, Alexander O.; and Lewis, Clarke H., to Oxy Metal Industries (Intra) Inc. Multi-layer braided tubular membrane reinforcement. 3,891,556, Cl. 210-490.000.
Richardson, Murl R., to Oil States Rubber Co. Pipeline cleaning ball and valve structure. 3,890,665, Cl. 15-104.06R.
Richter, Albert P., Jr., to Texaco Inc. Swaged-tube coupling. 3,891,251, Cl. 285-338.000.
Richter, Helmut: *See—*
Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, 3,891,196.
Richter, Sidney B.; and Barnas, Eugene F., to Velsicol Chemical Corporation. 2-Alkoxy 3,5-dihalo-benzaldoximes. 3,891,687, Cl. 260-453.00R.
Richter, Sidney B.; and Barnas, Eugene, to Velsicol Chemical Corporation. Compositions of matter. 3,891,701, Cl. 260-545.00R.
Ricoh Co., Ltd.: *See—*
Yasumori, Akiyoshi; Ohta, Katsuichi; Kunikane, Makoto; and Abe, Michiharu, 3,891,513.
Riddick, John A.: *See—*
Hodge, Edward B.; and Riddick, John A., 3,891,615.
Riddle, Charles F.: *See—*
Trainor, Maurice J.; and Riddle, Charles F., 3,891,341.
Ridgeway, William G.: *See—*
Ellis, James P.; and Ridgeway, William G., 3,891,173.
Ridgway, John A., Jr.; and Chao, Kwei C., to Standard Oil Company. Extraction of undesirable flavor and odor components from microbial cells. 3,891,772, Cl. 426-60.000.
Riegel Textile Corporation: *See—*
Teed, Richard K., 3,890,926.
Riester, Hans: *See—*
Burger, Hans; and Riester, Hans, 3,891,418.
Rikagaku Kenkyusho: *See—*
Yoshida, Kiyota; and Ejima, Mizuo, 3,891,472.
Riker Laboratories, Inc.: *See—*
Sugisaka, Nobuyuki, 3,891,661.
Rippel, Leopold: *See—*
Karobath, Ernst; and Rippel, Leopold, 3,891,463.
Ritter, Johannes Andreas: *See—*
Ritter, Karl Hermann; and Ritter, Johannes Andreas, 3,891,244.
Ritter, Karl Hermann; and Ritter, Johannes Andreas. Notepad. 3,891,244, Cl. 283-56.000.
Riverside Press, Inc.: *See—*
O'Neal, Cothburn M.; and Mayo, Alfred M., 3,891,141.
Robbins, Medford Dwight: *See—*
Broaddus, Charles David; and Robbins, Medford Dwight, 3,891,672.
Robeller, Walter: *See—*
Rometsch, Werner; Robeller, Walter; Lutz, Gerhard; Reichel, Eckehart; Bosch, Paul; and Vohringer, Gerd, 3,890,883.
Roberson, Cletis L.; Russell, Robert G.; Stream, Ralph M.; and Leaman, Harold E., to Owens-Corning Fiberglas Corporation. Strand doctoring means. 3,890,925, Cl. 118-104.000.

Robert Bosch G.m.b.H.: *See—*
Beesch, Otto, 3,891,529.
Bosch, Paul, 3,891,354.
Dworak, Wilhelm; Jons, Claus; and Vlemmings, Jan, 3,891,360.
Hurst, Kurt, 3,891,991.
Rometsch, Werner; Robeller, Walter; Lutz, Gerhard; Reichel, Eckehart; Bosch, Paul; and Vohringer, Gerd, 3,890,883.
Sauerbrunn, Wolfgang, 3,891,077.
Schwerin, Gunther, 3,891,182.
Stroezel, Reinhold; Hettich, Alfred; and Civarella, Alfredo, 3,891,049.
Wahl, Josef, 3,890,946.
Werner, Peter; and Drews, Ulrich, 3,890,944.

Roberts, Michael G.; and Matuszak, Michael L., to Owens-Corning Fiberglas Corporation. Thermoplastic ingredient for molding compounds. 3,891,596, Cl. 260-40.00R.

Roberts, Robert E., to Under Sea Industries, Inc. Refillable pressurized gas cartridge and attachment means for refilling same. 3,890,662, Cl. 9-313.000.

Roberts, Thomas G.; Barr, Thomas A., Jr.; and Rust, Charles M., to United States of America, Army. Imploding cylinder metal vapor laser. 3,891,941, Cl. 331-94.50G.

Robertshaw Controls Company: *See—*
Tyler, Hugh J., 3,891,467.

Robertson Bauelemente G.m.b.H.: *See—*
Summers, John E.; and Rose, Gerhard, 3,891,471.

Robertson, Peter Struan; and Bysouth, Raymond, to New Zealand Dairy Research Institute. Method and apparatus for cheese manufacture. 3,891,783, Cl. 426-478.000.

Robinson, David V., to Rosini, Donald A., a part interest. Aseptic packaging of foods. 3,891,779, Cl. 426-399.000.

Robinson, Ivan B., to Kaiser Aluminum & Chemical Corporation. Aluminum vacuum brazing sheet. 3,891,400, Cl. 29-197.500.

Rockwell International Corporation: *See—*
Atkinson, James L., 3,891,285.
Buelk, Eggert, 3,890,920.
Hirvela, Robert J.; and Bolin, Robert A., 3,891,971.
Lyman, Merton C., Jr.; and Berry, Ronald, 3,891,010.
Marcus, Thomas J., 3,891,798.

Rodgers, Daniel L.; and Cater, Thomas F., to King Radio Corporation. Avionics display circuit having optical feedback and a rotary solenoid actuator therein. 3,891,832, Cl. 235-150.200.

Roe, Harry James, to Track Pack Corporation. Backhoe compactor/scraper apparatus. 3,891,342, Cl. 404-128.000.

Roemming, Karl: *See—*
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,534.
Cordone, Leonard G.; Donakowski, William A.; Morgan, John R.; and Roemming, Karl, 3,891,542.

Roeschlau, Peter: *See—*
Stary, Emil; Roeschlau, Peter; and Bernt, Erich, 3,891,573.

Rogers, Edward F.: *See—*
Hannah, John; Rogers, Edward F.; and Graham, Donald W., 3,891,758.

Rohm and Haas Company: *See—*
Hoey, Charles E., 3,891,487.

Rolair Systems, Inc.: *See—*
Burdick, Robert E., 3,891,048.

Rollison, Leon C.: *See—*
Tisdale, Robby R.; Rollison, Leon C.; and Hall, Ben F., 3,891,011.

Romeo, Donald E.; and MacMillan, Archie J., to TRW Inc. Low frequency field effect amplifier. 3,891,936, Cl. 330-28.000.

Rometsch, Werner; Robeller, Walter; Lutz, Gerhard; Reichel, Eckehart; Bosch, Paul; and Vohringer, Gerd, to Robert Bosch G.m.b.H. Flow control arrangement for an axial piston pump. 3,890,883, Cl. 91-499.000.

Rommerswinkel, Heinrich-Wilhelm: *See—*
Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, 3,891,196.

Ronco, Karl: *See—*
Hari, Stefan; and Ronco, Karl, 3,891,685.

Roper, Howard Frank, to Broken Hill Proprietary Company Limited, The. Bulk material unloader. 3,891,079, Cl. 198-36.000.

Rosati, Robert L., to Pfizer Inc. 6-[Alpha-(amidinothioacylamido)-penicillanic acids. 3,891,627, Cl. 260-239.100.

Rose, Gerhard: *See—*
Summers, John E.; and Rose, Gerhard, 3,891,471.

Rose, Lloyd E., to Textron Inc. Rotary card file. 3,890,727, Cl. 40-68.600.

Rosenthal, Rudolph; and Kieras, Joseph A., to Atlantic Richfield Company. Continuous process for production of hydrogen peroxide. 3,891,748, Cl. 423-587.000.

Rosini, Donald A.: *See—*
Robinson, David V., 3,891,779.

Rosinski, Edward J.: *See—*
Demmel, Edward J.; Nace, Donald M.; Owen, Hartley; and Rosinski, Edward J., 3,891,540.

Rositto, Vincent E.: *See—*
Kruger, Jean J.; and Rositto, Vincent E., 3,890,796.

Ross, Milton Dean: *See—*
Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., 3,891,013.

Rossenov, Ivan Georgiev: *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.

Roters, Herbert C., deceased; and by Roters, Mary D., executrix, to Mechanical Technology Incorporated. Compensated reciprocating electrodynamic machine. 3,891,874, Cl. 310-14.000.

Roters, Mary D., executrix: *See—*
Roters, Herbert C., deceased; and Roters, Mary D., executrix, 3,891,874.

Roth, Edwin H. Matchbook with pull matches. 3,891,083, Cl. 206-98.000.

Rounsaville, David L.: *See—*
Goodwin, Charles C.; Rounsaville, David L.; and Grimm, James H., 3,891,089.

Rousseau, Gilles, to Patrick Harrison & Company Limited. Spray device. 3,891,148, Cl. 239-68.000.

Roussel Uclaf: *See—*
Derible, Pierre Henri; and Lavaux, Jean-Paul, 3,891,636.

Roussey, Yordan Todev: *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.

Rowe International, Inc.: *See—*
Brotz, William C., 3,891,970.

Rowe, William: *See—*
Halpern, Gregory; and Rowe, William, 3,891,443.
Katz, Leon; Rowe, William; and Golda, Eugene, 3,891,439.

Rowse, Robert A.; and Watson, George R., to Norton Company. Zirconia-alumina abrasive grain and grinding tools. 3,891,408, Cl. 51-295.000.

Ruben, Henning M.: *See—*
Elam, James O.; and Ruben, Henning M., 3,890,967.

Rudolph, Hans; Heine, Hans-Georg; Fuhr, Karl; and Schnell, Hermann, to Bayer Aktiengesellschaft. Butyric acid derivatives as photosensitizers for unsaturated compounds. 3,891,524, Cl. 204-159.150.

Ruh, Herbert: *See—*
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,891,819.

Runte, Helmut; and Schwartz, Peter, to Bayer Aktiengesellschaft. Method for manufacturing hollow screws for heat exchangers. 3,890,685, Cl. 29-156.80H.

Rusch, Eunice M.: *See—*
Lambou, Madeline G.; Spadaro, James J.; and Rusch, Eunice M., 3,891,571.

Rushford, Wilson H., to Phillips Petroleum Company. Pelleting of carbon black. 3,891,366, Cl. 425-140.000.

Rushing, Frank C., to Westinghouse Electric Corporation. Bearingless oscillating scanner. 3,891,299, Cl. 350-6.000.

Russell Finex Limited: *See—*
Choules, Marcel Henry; and Hare, Alan William, 3,891,191.

Russell, James T., to Battelle Development Corporation. Method and apparatus for synchronizing photographic records of digital information. 3,891,794, Cl. 178-6.70R.

Russell, Robert G.: *See—*
Roberson, Cletis L.; Russell, Robert G.; Stream, Ralph M.; and Leaman, Harold E., 3,890,925.

Russell, Thomas E.: *See—*
Califano, Frank L.; Stepien, George, Jr.; and Russell, Thomas E., 3,891,586.

Russo, Michael T. Link chain support post. 3,891,189, Cl. 256-1.000.

Rust, Charles M.: *See—*
Roberts, Thomas G.; Barr, Thomas A., Jr.; and Rust, Charles M., 3,891,941.

Ryan, Charles C.; Siedband, Melvin D.; and Fuchs, Abraham M., to United States of America, Navy. Search-while-track system. 3,891,988, Cl. 343-16.0LS.

Ryan, Maurice A.; and Barron, Morton A., to United States of America, Army. Apparatus for detecting changes in the orientation of a mortar gun tube. 3,891,323, Cl. 356-154.000.

S. A. Automobiles Citroen: *See—*
Grosseau, Albert, 3,891,278.

S & S Product Engineering Service, Inc.: *See—*
Spisak, Edward G., 3,891,276.

S.T. Dupont: *See—*
Kleine, Jean Jacques, 3,891,147.

Sachs, Jeffrey L.: *See—*
McKenzie, James M.; and Sachs, Jeffrey L., 3,890,836.

Sadler, Keith A.; and Phillips, Ralph E., Jr. Clock controlled thermostat. 3,891,144, Cl. 236-46.000.

Sadler, Thomas Harry, to Johns-Manville Corporation. Method of increasing the production rate of asbestos fiber containing articles and product thereof. 3,891,498, Cl. 162-154.000.

Saegusa, Kyuji; Sonobe, Eitetsu; and Sudo, Susumu. Flapper wheel. 3,890,746, Cl. 51-334.000.

Sahm, Peter; and Sebalj-Novosel, Renata, to Aktiengesellschaft Brown, Boveri & Cie. Methods of, and apparatus for, controlling the crystalline structure of alloys, and alloys so produced. 3,891,431, Cl. 75-122.000.

Sailer, Andre Louis; and Frank, Pierre, to Pechiney Ugine Kuhlmann. Metallized and non-metallized diphenol methane containing azo dyestuffs. 3,891,617, Cl. 260-148.000.

St. John, Ward A.: *See—*
Davis, Alwyn K.; and St. John, Ward A., 3,890,973.

Sakaguchi, Takehiko, to Hioki Electric Works Co., Ltd. Unit for assembling elements of taut band suspension type indicating instrument. 3,891,923, Cl. 324-154.00R.
Sakai Chemical Industry Company, Ltd.: *See*—
Kotone, Akira; Hoda, Masahiro; and Hori, Takeshi, 3,891,470.
Sakai, Takeyo: *See*—
Matsuda, Kazuo; Tanaka, Yoshiaki; and Sakai, Takeyo, 3,891,715.
Sakakibara, Kyoichi; Gondoh, Masaaki; Shimazawa, Eiichirou; and Izumiya, Nobuo, to Teikoku Hormone Mfg. Co., Ltd. Solid phase synthesis of calcitonins on benzhydrylamine type resins. 3,891,614, Cl. 260-112.500.
Sakamoto, Seiho: *See*—
Abe, Toshizo; Sakamoto, Seiho; Go, Shigeo; Maekuma, Koichi; Yamada, Yoshitaka; and Hirashima, Yasumasa, 3,891,611.
Sakata, Ryuichi: *See*—
Yaeda, Yasuyuki; Chikatsu, Yoshishige; Ando, Noriaki; and Sakata, Ryuichi, 3,891,724.
Salg, George, to Reflect-O-Lite Manufacturing Company. Electrical box. 3,891,113, Cl. 220-3.600.
Sallay, Stephen I., to Purdue Research Foundation. n-Phenethyl trialkylmethanobenz-azolines. 3,891,658, Cl. 260-293.540.
Salsbury, Phillip J.: *See*—
Amelio, Gilbert F.; Livezey, Jack A.; and Salsbury, Phillip J., 3,891,977.
Saltzman, William H., to Intellectual Property Development Corporation. Synthesis of steroids. 3,891,681, Cl. 260-397.100.
Sample, Thomas E., Jr.: *See*—
Palmer, Harold A.; and Sample, Thomas E., Jr., 3,891,655.
Samuelian, Maurice P.; and Buckler, Benjamin, to General Signal Corporation. Multi-bowl supporting table. 3,891,171, Cl. 248-131.000.
Sanders Associates, Inc.: *See*—
Parkin, William J., 3,891,843.
Sanders, Jerrell. Portable valve actuator. 3,891,181, Cl. 251-128.000.
Sandoz, Inc.: *See*—
Anderson, Paul L., 3,891,716.
Sandoz Ltd.: *See*—
Fleck, Fritz; and Schmid, Hans Rudolf, 3,891,632.
Sanyo Electric Company, Ltd.: *See*—
Takahara, Ichiro; Yabu, Tadahiko; and Fujita, Jihei, 3,891,796.
Sanzone, Anthony V.; and Sanzone, Antonio C. Collapsible container and latching member. 3,890,932, Cl. 119-19.000.
Sanzone, Antonio C.: *See*—
Sanzone, Anthony V.; and Sanzone, Antonio C., 3,890,932.
Sarancha, Vladimir Nikolaevich: *See*—
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.
Sargent, Henry O.: *See*—
Marsh, Alexander J.; and Sargent, Henry O., 3,891,737.
Sarka, Albert J., to Harris-Intertype Corporation. Method of making cutting and scoring dies. 3,891,437, Cl. 96-36.300.
Sarkes Tarzian, Inc.: *See*—
Vaidettaro, Alarico A., 3,890,846.
Sartre, Bernard: *See*—
Bouy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, 3,891,531.
Sato, Takaaki; and Ishida, Kengo, to Kyowa Hakko Kogyo Co., Ltd. Process for recovering fats, oils and proteins from waste liquor. 3,891,770, Cl. 426-32.000.
Sato, Tomoari: *See*—
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,891,517.
Saucier, Michel: *See*—
Monkovic, Ivo; Saucier, Michel; and Montzka, Thomas Alfred, 3,891,657.
Sauerbrunn, Wolfgang, to Robert Bosch G.m.b.H. High-speed printer. 3,891,077, Cl. 197-1.00R.
Saver, Helene. Sanitary pet box. 3,890,931, Cl. 119-1.000.
Sawada, Hideo; and Kawamoto, Junji, to Daicel, Ltd. Method for preparing cigarette filter. 3,890,983, Cl. 131-267.000.
Saxton, Ronald Luther: *See*—
Wolfe, Paul Dillon; Saxton, Ronald Luther; and Cameron, Donald Dean, 3,891,609.
Scal (Societe de Conditionnement en Aluminum): *See*—
Michel, Phlippoteau, 3,890,822.
Scarpa Laboratories, Inc.: *See*—
Scarpa, Thomas J., 3,891,869.
Scarpa, Thomas J., to Scarpa Laboratories, Inc. Piezoelectrically driven ultrasonic generator. 3,891,869, Cl. 310-8.200.
Scarpino, Leopoldo, to Amax Inc. Means for monitoring the safety of a remote electrical ground connection. 3,891,894, Cl. 317-18.00C.
Schafer, Josef, to Telesco Brophey Limited. Umbrella frame. 3,890,990, Cl. 135-20.00R.
Schaffner, Carl P.: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 3,891,752.
Schane, Alvin Mansfield, to American Can Company. Full-open easy-open container. 3,891,116, Cl. 220-270.000.
Scharfen, Hans; Schmitz, Karl Heinz; Strerath, Theo; and Jenko, Dragutin, to Paul Forkardt Kommanditgesellshcaft. Device for oiling and de-oiling compressed air. 3,891,058, Cl. 184-55.00A.
Schein, Edward W.: *See*—
Selden, Robert W.; and Schein, Edward W., 3,890,759.
Schekochikhin, Serafim Vasilievich: *See*—
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.
Schering AG: *See*—
Todt, Hans-Gunther; and Voss, Gunter, 3,891,520.
Schering Aktiengesellschaft: *See*—
Vorbruggen, Helmut; and Niedballa, Ulrich, 3,891,623.
Schering Corporation: *See*—
Gold, Elijah H., 3,891,697.
Sherlock, Margaret H., 3,891,761.
Tanabe, Masato, 3,891,677.
Schick, John W.: *See*—
Cushman, Donald R.; and Schick, John W., 3,891,620.
Schiff, Joseph. Office machine including flat article feeder. 3,891,203, Cl. 271-4.000.
Schimitschek, Erhard J.; Trias, John A.; and Celto, John E., to United States of America, Navy. Lasing dyes. 3,891,569, Cl. 252-301.20R.
Schimmer, Rigobert: *See*—
Messerschmidt, Jurgen; and Schimmer, Rigobert, 3,891,483.
Schinman, Gary B.: *See*—
Schmidt, Thomas R.; and Schinman, Gary B., 3,891,847.
Schirmag, Klaus-Peter, to Mannesmannrohren-Werke Aktiengesellschaft. Reversibly moving elongated stock in transverse direction. 3,891,081, Cl. 198-218.000.
Schirmer, Hermann; Peilstocker, Gunter; and Schuster, Herbert, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions of a polycarbonate and a graft copolymer of styrene and acrylonitrile on an acrylic acid ester polymer. 3,891,719, Cl. 260-873.000.
Schloemann-Siemag Aktiengesellschaft: *See*—
Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, 3,891,025.
Schlossberg, Howard; and Milam, David, to United States of America, Air Force. Configuration for efficient cooling and excitation of high average power solid state lasers. 3,891,945, Cl. 331-94.50P.
Schluter, Siegfried Hans-Dietmar; and Kraft, Erich, to Apparatebau Rothemuhle Brandt & Kritzler. Cylindrical heating-surface support structure for regenerative air preheaters. 3,891,030, Cl. 165-10.000.
Schmid, Hans Rudolf: *See*—
Fleck, Fritz; and Schmid, Hans Rudolf, 3,891,632.
Schmid Laboratories, Inc.: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 3,891,752.
Schmidt, Gertraud A., to General Cable Corporation. Communication cable with improved coated shield. 3,891,791, Cl. 174-107.000.
Schmidt, Gunther; Theiss, Armin; Dederra, Carl-Helmut; and Kaiser, Leonhard. Fluid cooled combustion chamber construction. 3,890,781, Cl. 60-267.000.
Schmidt, Paul, to Tracto Technik Paul Schmidt. Control arrangement for the forward and backward movement of percussive boring rams. 3,891,036, Cl. 173-91.000.
Schmidt, Thomas R.; and Schinman, Gary B., to Shell Oil Company. Method and apparatus for controlling the addition of a combustion assisting fluid to a flare. 3,891,847, Cl. 250-342.000.
Schmidt, William M.: *See*—
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P., 3,890,772.
Schmitt, Manfred: *See*—
Wolz, Werner; Bender, Hans; and Schmitt, Manfred, 3,890,992.
Schmitter, Albert, to Mettler Instrumente AG. Inclination spring balance. 3,891,040, Cl. 177-230.000.
Schmitz, Karl Heinz: *See*—
Scharfen, Hans; Schmitz, Karl Heinz; Strerath, Theo; and Jenko, Dragutin, 3,891,058.
Schmutz, Jean; Hunziker, Fritz; and Kunzle, Franz Martin, to Wander Ltd. 2-trifluoromethyl-sulphonyl-11-substituted-piperazinyl-dibenz [b,f][1,4] oxazepine. 3,891,647, Cl. 260-268.0TR.
Schnell, Hermann: *See*—
Rudolph, Hans; Heine, Hans-Georg; Fuhr, Karl; and Schnell, Hermann, 3,891,524.
Schnur, Rudolf: *See*—
Danneil, Axel; Flickinger, Erich; Graefje, Heinz; Plass, Reinhold; and Schnur, Rudolf, 3,891,511.
Schoberl, Werner, to Licentia Patent-Verwaltungs-GmbH. Optical-electronic semiconductor coupling element. 3,891,858, Cl. 250-551.000.
Schocher, Arno Johannes; and Wiss, Oswald, to Hoffmann-La Roche Inc. Process for the manufacture of zeaxanthin. 3,891,504, Cl. 195-28.00R.
Schoenberg, Jules E.: *See*—
Ray-Chaudhuri, Dilip K.; Schoenberg, Jules E.; and Flanagan, Thomas P., 3,891,584.
Schoeppl, Hubert: *See*—
Petersen, Harro; Erhard, Paulus; Queins, Hubertus; and Schoeppl, Hubert, 3,891,608.
Scholten-Honig Research N.V.: *See*—
Boonstra, Douwe Johannes; and Berkhout, Frans, 3,891,624.
Scholz, Werner: *See*—
Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, 3,891,730.
Schon, Nikolaus: *See*—
Kuhn, Rainer; and Schon, Nikolaus, 3,891,607.

Schoning, Rudolf: *See—*
Hecht, Gert; Schoning, Rudolf; and Pieper, Wolfgang, 3,891,355.

Schonlau, Herbert; and Meyerhoff, Walter, to Teves-Thompson GmbH. Valve rotating devices. 3,890,943, Cl. 123-90.300.

Schroder, Walter. Drive for converters, rotating drums, plate conveyors or the like. 3,890,852, Cl. 74-410.000.

Schroeder, Thaddeus, to General Motors Corporation. Time division multiplex system for a motor vehicle. 3,891,965, Cl. 340-52.00F.

Schubert, Wilfried, to National Advertising Company. Display character module for changeable copyboards. 3,890,728, Cl. 40-140.000.

Schuller, Walter H.: *See—*
Parkin, Bernard A., Jr.; and Schuller, Walter H., 3,891,612.

Schumacher, Bernd: *See—*
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,891,819.

Schupp, Philipp P.: *See—*
Kannapell, David H.; Schupp, Philipp P.; and Amrein, David, 3,891,248.

Schuster, Herbert: *See—*
Schirmer, Hermann; Peilstocker, Gunter; and Schuster, Herbert, 3,891,719.

Schuster, Samuel R.; and Kopito, Louis, to Ovutime, Inc. Mucus sampling and measuring systems, devices and processes. 3,891,325, Cl. 356-205.000.

Schwartz, Peter: *See—*
Runte, Helmut; and Schwartz, Peter, 3,890,685.

Schwarz, Wilhelm, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Buffer structure. 3,891,200, Cl. 267-140.000.

Schwerin, Gunther, to Robert Bosch G.m.b.H. Arrangement for maintaining a shiftable member in a plurality of shifted positions. 3,891,182, Cl. 251-297.000.

SCI Systems, Inc.: *See—*
Pierce, Oscar L.; Hutchison, Arthur H.; King, Olin B.; and McMillian, Lonnie S., 3,890,968.

Science Research Council: *See—*
Joyce, Norman George, 3,891,868.

Scott, Alan N.: *See—*
Kollonitsch, Janos; Scott, Alan N.; and Doldouras, George A., 3,891,668.

Scott, Kenneth W.; and Calderon, Nissim, to Goodyear Tire & Rubber Company, The. Preparation of graft, block and crosslinked unsaturated polymers and copolymers by olefin metathesis. 3,891,816, Cl. 260-889.000.

Scott, Lyle B., to Byron Jackson Inc. Annulus pressure controlled testing apparatus. 3,891,033, Cl. 166-133.000.

Scott Paper Company: *See—*
Touchette, Albert F., 3,891,318.

Scullin, Francis E., to Crown Recreation, Inc. Heat shrinking dartboard cage and one piece core. 3,891,214, Cl. 273-102.00B.

Sebalj-Novosel, Renata: *See—*
Sahm, Peter; and Sebalj-Novosel, Renata, 3,891,431.

Segawa, Kazuyoshi, to Toshiba Kikai Kabushiki Kaisha. Injection cylinders of die cast machines. 3,891,126, Cl. 222-334.000.

Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P. Self-propelled lawn mower. 3,890,772, Cl. 56-202.000.

Seiler, Karl-Heinz: *See—*
Lenzkes, Dieter; and Seiler, Karl-Heinz, 3,891,907.

Sekiguchi, Kouichi, to Iwasaki Tsushinki Kabushiki Kaisha. Two-tone generator using transistors for switching LC resonant circuits. 3,891,940, Cl. 331-48.000.

Sekmakas, Kazys, to DeSoto, Inc. Water-dispersible cationic polyurethane resins. 3,891,527, Cl. 204-181.000.

Selam, Gabriel. Device for automatically starting and stopping an asynchronous motor. 3,891,903, Cl. 318-212.000.

Selden, Robert W.; and Schein, Edward W., to Weyerhaeuser Company. Connector. 3,890,759, Cl. 52-753.00C.

Sell, James F. Ski bar. 3,890,918, Cl. 114-235.0WS.

Sellstedt, John H.; and Wolf, Milton, to American Home Products Corporation. pyrrolo[1,2,3-de]quinoxalin-2-(3H)-ones and related compounds. 3,891,643, Cl. 260-250.00Q.

Serrill, Dehart M. Mechanism for fishing lure. 3,890,735, Cl. 43-36.000.

Sessa, Raymond V. Wheeled ski skate. 3,891,225, Cl. 280-11.190.

Seuthe, Eberhard, deceased; and by Seuthe, Ellen, executrix. Electrically heated smoke or steam generator. 3,891,826, Cl. 219-273.000.

Seuthe, Ellen, executrix: *See—*
Seuthe, Eberhard, deceased; and Seuthe, Ellen, executrix, 3,891,826.

Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto, to Montecatini Edison S.p.A. Graft polymers of vinyl chloride on unsaturated olefinic elastomers and process for the preparation thereof. 3,891,720, Cl. 260-878.00R.

Severinsson, Lars Mattis; and Persson, Gert Artur, to Svenska Aktiebolaget Bromsregulator. Device responsive to vehicle loading with signal generating means for brake actuation. 3,891,280, Cl. 303-22.00R.

Sewing, Gerhard; and Bachor, Jurgen, to Paul Hettisch & Co. Adjustable furniture hinge. 3,890,670, Cl. 16-129.000.

Shackelford, Albert D.; Holladay, John H.; and Lloyd, E. J., to United States of America, Agriculture. Chicken coop unstacking machine. 3,891,097, Cl. 214-8.50H.

Shah, Pir Ghulam Samadani: *See—*
Battaerd, Hendrik Adrian Jacobus; Bolto, Brian Alfred; and Shah, Pir Ghulam Samadani, 3,891,576.

Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; Kadi-Ogly, Ibragim Akhmedovich; and Tjurin, Jury Grigorievich. Directly liquid cooled rotor winding for a non-salient pole synchronous electric machine. 3,891,877, Cl. 310-61.000.

Shatto, Walter Clifton, Jr.: *See—*
Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., 3,891,013.

Shea, Philip J.; and Abdallah, Abdulmuniem H., to Dow Chemical Company, The. Psychotherapeutic methods employing thioureas. 3,891,769, Cl. 424-322.000.

Shearon, Michael Hillas; and Besel, Roland Leroy, to du Pont de Nemours, E. I., and Company. Method and apparatus for splicing a standby web to a running web. 3,891,158, Cl. 242-58.100.

Shell Oil Company: *See—*
Isaac, Eirlys R.; and Kirby, Peter, 3,891,675.
Lintzenich, Vincent C., 3,891,667.
Schmidt, Thomas R.; and Schinman, Gary B., 3,891,847.
Smitherman, Chester L., Jr.; Overcashier, Robert H.; and Kruka, Vitold R., 3,891,593.

Shelly, Jacques, to De Cordova, James. Bicycle wheel drive. 3,891,235. Cl. 280-252.000.

Shen, Kuo-Cheng, to Canadian Patents & Development Limited. Method and apparatus for pressing particleboard. 3,891,738, Cl. 264-101.000.

Shen, Tsung-Ying: *See—*
Witzel, Bruce E.; and Shen, Tsung-Ying, 3,891,699.

Sherlock, Margaret H., to Schering Corporation. N-Methyl-d-glucamine salt of 2(2-methyl-3'-trifluoro-methylanilino) nicotinic acid in the treatment of pain. 3,891,761, Cl. 424-266.000.

Sherman, Edward: *See—*
Gilbert, Eugene C.; Jones, Robert E.; and Sherman, Edward, 3,891,717.

Sherry, Howard S.: *See—*
Oleck, Stephen M.; Stein, Thomas R.; Sherry, Howard S.; and Milstein, Donald, 3,891,541.

Shibagaki, Masao; and Oonishi, Masayoshi, to Toyo Kogoyo Co., Ltd.; and Mitsubishi Kenki Kabushiki Kaisha. Distributor for engine ignition system. 3,890,947, Cl. 123-148.0DS.

Shimazawa, Eiichirou: *See—*
Sakakibara, Kyoichi; Gondoh, Masaaki; Shimazawa, Eiichirou; and Izumiya, Nobuo, 3,891,614.

Shiono, Taiichi: *See—*
Matubayashi, Tadao; Shiono, Taiichi; Hukuda, Yositugu; and Kimura, Toshio, 3,891,503.

Shiraishi, Minoru: *See—*
Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, 3,891,574.

Shoda, Hiroshi; and Araki, Mikio, to Kabushiki Kaisha Komatsu Seisakusho. Control system for a balance correcting machine. 3,891,835, Cl. 235-151.110.

Shoemaker, Harold L.: *See—*
Kumagai, Tom T.; Leone, William C.; May, Michael; Shoemaker, Harold L.; and Howard, Roy A., 3,891,910.

Showa Manufacturing Co., Inc.: *See—*
Kuwano, Nobuyori; and Tajima, Yasutomo, 3,891,236.

Showalter, Merle Robert. Pilot injection fuel injection pump. 3,891,151, Cl. 239-533.000.

Showell, Richard G. D., to Bar Productions (Bromsgrove) Limited. Storage assemblies. 3,890,903, Cl. 104-1.00R.

Shryock, Stanley H.: *See—*
Cunningham, Willis C.; George, Charles R.; and Shryock, Stanley H., 3,891,454.

Shull, William A.: *See—*
Dowley, Mark W.; and Shull, William A., 3,891,943.

Sibtec, AB: *See—*
Tiedemann, Wolfgang Otto, 3,891,551.

Sidlinger, Bruce C. Concealed spring anchoring means for trampolines and method of producing same. 3,891,208, Cl. 272-65.000.

Siedband, Melvin D.: *See—*
Ryan, Charles C.; Siedband, Melvin D.; and Fuchs, Abraham M., 3,891,988.

Sieg, Arno: *See—*
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,891,819.

Siegel, Edgar: *See—*
Sommer, Richard; Wiesel, Manfred; Otten, Hans-Gunter; and Siegel, Edgar, 3,891,619.

Siejko, Danuta Janina: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.

Siemens Aktiengesellschaft: *See—*
Debray, Werner, 3,891,820.
Diepers, Heinrich; Musebeck, Horst; and Wirkner, Eduard, 3,890,700.
Diepers, Heinrich, 3,890,701.
Dotzer, Richard; and Plundrich, Winfried, 3,890,835.
Haeusler, Jochen, 3,891,143.
Hecht, Gert; Schoning, Rudolf; and Pieper, Wolfgang, 3,891,355.
Hertz, Walter; Mentel, Jurgen; and Stroh, Jan, 3,891,814.
Jakszt, Werner, 3,891,897.
Kleen, Gerhard; and Herrmann, Albert, 3,891,863.
Lenzkes, Dieter; and Seiler, Karl-Heinz, 3,891,907.

Sievers, Robert E.; and Brooks, Joseph J. Separation of compounds differing in isotopic composition. 3,891,413, Cl. 55-67.000.

Sievers, Willi; and Van Steenput, Andre, to Continental Gummi-Werke Aktiengesellschaft. Mold segment for vulcanizing molds. 3,891,363, Cl. 425-28.00R.

Signora, Maurizio, to Ing. C. Olivetti & C., S.p.A. Apparatus for moulding helical gears by compression of powders. 3,891,367, Cl. 425-78.000.

Silberschlag, Russell E., to Borg-Warner Corporation. Hydraulic actuator. 3,890,884, Cl. 92-84.000.

Simington, Jack F. Automatic chain sharpener. 3,890,857, Cl. 76-25.00A.

Simmons, George A., to Owens-Illinois, Inc. Glass-ceramic and process therefor. 3,891,419, Cl. 65-30.000.

Simmons, John Richard: *See—*
Neal, Francis John; and Simmons, John Richard, 3,890,803.

Simon Engineering Dudley Limited: *See—*
Ashworth, Denis Henry, 3,891,056.

Simon, Jack, to Athlone Industries, Inc. Garment fastener subassembly and method for making the same. 3,890,679, Cl. 24-213.000.

Singer Company, The: *See—*
Fazio, James Anthony, 3,891,889.
Feltz, Albert John, 3,890,853.
Herr, john A.; and Jaffe, Wolfgang, 3,891,876.

Sink, William Howard; and Flotow, Richard Allen, to Dana Corporation. Clutch lever with low friction pivot. 3,891,072, Cl. 192-99.00A.

Sintokogio, Ltd.: *See—*
Terada, Hideto, 3,891,096.

Sisk, George William, Jr., to Whirlpool Corporation. Bimetal thermostat defrost and air temperature control. 3,890,799, Cl. 62-215.000.

Sjostrand, Gunnar O.; and Sjostrand, Staffan G., to Musikindustriell Forskning MIFO AB. Device for stringing and tuning of strings in pianos, grand pianos, harpsichords, zithers and the like. 3,890,872, Cl. 84-207.000.

Sjostrand, Staffan G.: *See—*
Sjostrand, Gunnar O.; and Sjostrand, Staffan G., 3,890,872.

SKF Industrial Trading and Development Company, B.V.: *See—*
Ernst, Horst; Brandenstein, Manfred; and Olschewski, Armin, 3,891,284.

Sletten, Andreas M.: *See—*
Yoon, Kue H.; Friedrich, Robert E.; and Sletten, Andreas M., 3,891,813.

Sliwka, Wolfgang: *See—*
Heil, Eduard; Kuchner, Karl; Sliwka, Wolfgang; and Smits, Harald, 3,891,603.

Sloan, Kenneth B.: *See—*
Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., 3,891,696.

Smid, Peter Max; and Kalter, Jan, to Koninklijke Nederlandsche Gisten Spiritusfabrieken N.V. Process for preparing penicillins. 3,891,628, Cl. 260-239.100.

Smid, Peter Max: *See—*
Henniger, Peter Wolfgang; and Smid, Peter Max, 3,891,635.

Smith, Don W.: *See—*
Allen, Thomas E.; and Smith, Don W., 3,890,783.

Smith, Fred T.; Munyon, Julian M.; and Gebhardt, James J., Jr., to Barber-Greene Company. Convergent link system for connecting a screed to the traction unit of a paving machine. 3,891,338, Cl. 404-84.000.

Smith, Frederick: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P., 3,890,772.

Smith, Gordon C., to Glaus, Pyle, Schomer, Burns and DeHaven, Inc. Material storage and transfer device. 3,891,099, Cl. 214-17.0DA.

Smith, James: *See—*
Auer, Robert Thomas; Campbell, Laurie Jay; Lohr, Raymond J.; and Smith, James, 3,891,234.

Smith, Lawrence L.: *See—*
Cole, Ernest R., Jr.; Dressel, Waldemar M.; and Smith, Lawrence L., 3,891,430.

Smith, Lynn Elwyn. Plastic one-piece saddle for plastic pipe. 3,891,247, Cl. 285-110.000.

Smith, Owen; and Holder, James F., to Love Oil Company, Inc. Crystal generator to inhibit scale formation and corrosion in fluid handling systems. 3,891,394, Cl. 23-273.00R.

Smith, Trevor James, to Imperial Chemical Industries Limited. Pyrimidyl-anthraquinone dyes. 3,891,645, Cl. 260-256.50R.

Smitherman, Chester L., Jr.; Overcashier, Robert H.; and Kruka, Vitold R., to Shell Oil Company. Method and apparatus for dissolution of polymer in solvent. 3,891,593, Cl. 260-34.200.

SmithKline Corporation: *See—*
Dunn, George L.; and Hoover, John R. E., 3,891,634.

SmithKline & French Laboratories Ltd.: *See—*
Black, James Whyte; and Durant, Graham John, 3,891,764.

Smits, Harald: *See—*
Heil, Eduard; Kuchner, Karl; Sliwka, Wolfgang; and Smits, Harald, 3,891,603.

Smrt, Thomas J. Actuator for aerosol can valve. 3,891,128, Cl. 222-402.170.

Snader, Earle Stuart, to Koppers Company, Inc. Drag scraper assembly for electrostatic precipitator. 3,891,414, Cl. 55-108.000.

Snazuk, Vladimir R. Spring biased prop for a pivoted member. 3,891,111, Cl. 217-60.00F.

Snoberger, Robert C.; Delker, Thomas C.; and Reschly, Richard L., to Travel Equipment Corporation. Travel trailer frame and suspension. 3,891,231, Cl. 280-106.50R.

Snow, Harold F., to Borden, Inc. Method for eviscerating clams. 3,890,676, Cl. 17-45.000.

Socha, Johannes; and Groth, Wolfgang, to W. Schlafhorst & Co., Maschinenfabrik. Driving mechanism for knitting needle displacement in warp knitting machines, such as raschel machines, particularly. 3,890,807, Cl. 66-86.00R.

Societe anonyme dite: MAR-PHA, Societe d'Etude et d'Exploitation de Marques: *See—*
Mardiguian, Jean; and Fournier, Pierre, 3,891,622.

Societe Anonyme Francaise du Ferodo: *See—*
Fieni, Walter, 3,891,271.

Societe Anonyme pour l'Industrie Chimique: *See—*
Blaise, Rolland Robert, 3,891,651.

Societe Anonyne dite: L'Oreal: *See—*
Kalopissis, Gregoire; Viout, Andre; and Vanlerberghe, Guy, 3,891,385.
Morane, Bruno; and Gueret, Jean Louis, 3,891,125.

Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France: *See—*
Thominet, Michel Leon, 3,891,671.

Societe Europeenne de Propulsion: *See—*
Tubeue, Jean Andre Georges, 3,890,784.

Societe Generale de Constructions Electriques et Mecaniques (ALSTHOM): *See—*
Nougaret, Marcel; and Belmonte, Jean-Claude, 3,891,931.

Sohma, Yukio: *See—*
Tsuji, Yoshikazu; and Sohma, Yukio, 3,891,959.

Sokolow, Nicholas N., to Plasti-Mac, Inc. Fluid distributor for rotary blow molding 3,891,371, Cl. 425-233.000.

Solv-X Inc.: *See—*
Lee, Edward, 3,890,988.

Sommer, Richard; Wiesel, Manfred; Otten, Hans-Gunter; and Siegel, Edgar, to Bayer Aktiengesellschaft. Phenyl-azo-indole compounds. 3,891,619, Cl. 260-165.000.

Sonnen, Rudolf, to Kleinewefers Industrie Companie GmbH. Seal for treatment containers, especially for width of textile goods. 3,891,223, Cl. 277-32.000.

Sonobe, Eitetsu: *See—*
Saegusa, Kyuji; Sonobe, Eitetsu; and Sudo, Susumu, 3,890,746.

Sony Corporation: *See—*
Suzuki, Tadao; and Kawada, Hirohito, 3,891,933.
Yanagisawa, Yuzuru; and Tamura, Hidemasa, 3,891,873.

Southern Weaving Company: *See—*
Tisdale, Robby R.; Rollison, Leon C.; and Hall, Ben F., 3,891,011.

Southgate, John Peter, to Lucas Electrical Company Ltd., The. Road vehicle lighting systems. 3,891,888, Cl. 315-82.000.

Spadaro, James J.: *See—*
Lambou, Madeline G.; Spadaro, James J.; and Rusch, Eunice M., 3,891,571.

Spademan, Richard G. Releasable ski binding. 3,891,227, Cl. 280-11.35R.

Sparling, Donald F. Concrete utility post with meter, gas line and water line. 3,891,899, Cl. 317-105.000.

Specht, Dieter, to Masyc AG. Construction set. 3,890,755, Cl. 52-645.000.

Special Metals Corporation: *See—*
McCarty, Michael, 3,891,425.

Sperry Rand Corporation: *See—*
Barney, Kay H.; and Lester, John M., 3,891,989.
Christensen, Bruce A., 3,891,969.
McMahon, Donald H., 3,891,968.
Oigarden, Tarald H.; Teltscher, Erwin S.; and Gross, Robert D., 3,891,985.

Spetzler, Edgar: *See—*
Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, 3,891,196.

Spiegel, Jacob: *See—*
Spiegel, William; Spiegel, Jacob; and Miller, Albert, 3,891,090.

Spiegel, William; Spiegel, Jacob; and Miller, Albert, to Gilbreth Company. Adhesive and mechanically secured carded package. 3,891,090, Cl. 206-478.000.

Spies, Kalus, to Bochumer Eisenhutte Heintzmann & Co. Mobile mine roof support with mining apparatus. 3,891,275, Cl. 299-32.000.

Spisak, Edward G., to S & S Product Engineering Service, Inc. Wheel and wheel trim assembly. 3,891,276, Cl. 301-37.00R.

Spooner, Peter David: *See—*
Beeston, John Wilmot; Bryant, Greyham Frank; and Spooner, Peter David, 3,890,817.

Sprecher & Schuh AG: *See—*
Thaler, Richard, 3,891,893.

Spurdle, Graham David. Corner bend in fibrous sheet material. 3,890,754, Cl. 52-631.000.

Stacy, Donald G.: *See—*
Ladd, Floyd N.; and Stacy, Donald G., 3,890,742.

Stahl, Welfred A.: *See—*
Day, Douglas B.; and Stahl, Welfred A., 3,891,165.

Stamicarbon, B.V.: *See—*
Verheijen, Egidius J. M.; Thoma, Jozef A.; and Deumens, Johannes J. M., 3,891,678.

Stamicarbon, N.V.: *See—*
Suverkropp, Geertrudes H.; and Reichrath, Werner, 3,891,702.

Stancliff, Robert E.: *See—*
Amor, William H., Jr.; and Stancliff, Robert E., 3,891,856.

Standard Oil Company: *See—*
Fields, Ellis K., 3,891,656.
Miloscia, William J.; Weisz, John J.; and Planz, Paul E., 3,891,722.
Ridgway, John A., Jr.; and Chao, Kwei C., 3,891,772.
Watson, Roger William; Udelhofen, John Henry; and Strukl, Joseph Stephan, 3,891,401.

Standard Telephones & Cables Limited: *See—*
Phillips, Geoffrey John; and Chambers, John Philip, 3,891,994.

Standley, Wendell Evert; and Beall, Glenn Lee, to Abbott Laboratories. Syringe injector with pop-top cap. 3,890,972, Cl. 128-220.000.

Stanish, Robert B., to Poster Products, Inc. Display device. 3,890,777, Cl. 58-50.00R.

Stanley, Leonard A.; and Kasbo, Loyd G., to Kendall Co., The. Substrate having a slightly water soluble binder and a herbicide for retarding weed growth over a long period of time. 3,891,423, Cl. 71-86.000.

Stanley Works, The: *See—*
Geoffrey, David Charles, 3,891,021.

Stapley, Edward O.; and Mata, Justo Martinez, to Merck & Co., Inc. Antibiotic ensanchomycin and process of producing the same. 3,891,754, Cl. 424-118.000.

Stapley, Edward O.: *See—*
Mata, Justo Martinez; and Stapley, Edward O., 3,891,753.

Stark, John, Jr., to RCA Corporation. High voltage protection circuit. 3,891,891, Cl. 315-379.000.

Starry, Robert F.: *See—*
Picard, Salvatore R.; and Starry, Robert F., 3,891,865.

Stary, Emil; Roeschlau, Peter; and Bernt, Erich, to Boehringer Mannheim GmbH. Aqueous cholesterol standard solution. 3,891,573, Cl. 252-408.000.

Staubs, Samuel M. Splint stretcher. 3,890,659, Cl. 5-82.000.

Stauffer Chemical Company: *See—*
Brokke, Mervin E., 3,891,662.
Mihailovski, Alexander, 3,891,688.
Weil, Edward D., 3,891,727.

Stawicky, Wolfgang; and Ossig, Horst, to Vereinigte Deutsche Metallwerke AG. Method of making copper-nickel alloys. 3,891,426, Cl. 75-10.00R.

Steigmann, Peter Edward: *See—*
Barry, David Edward; and Steigmann, Peter Edward, 3,891,887.

Stein, Thomas R.: *See—*
Oleck, Stephen M.; Stein, Thomas R.; Sherry, Howard S.; and Milstein, Donald, 3,891,541.

Steininger, Hans-Peter: *See—*
Gersbeck, Rolf; Greten, Berndt; and Steininger, Hans-Peter, 3,891,376.

Stelmakh, Viktor Alexeevich: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.

Stephen, John F., to Ciba-Geigy Corporation. Hindered Phenolic S-Trithiane 1,1,3,3,5,5-Hexaoxides. 3,891,673, Cl. 260-327.00T.

Stephenson, Kenneth: *See—*
Betts, Peter Alan; and Stephenson, Kenneth, 3,891,392.

Stepien, George, Jr.: *See—*
Califano, Frank L.; Stepien, George, Jr.; and Russell, Thomas E., 3,891,586.

Sterling Drug Inc.: *See—*
Diana, Guy D.; and Hinshaw, William B., Jr., 3,891,674.

Stertz, Leroy F.: *See—*
Neises, Reuben J., 3,891,080.

Stevens Corporation: *See—*
Christoff, Chris A., 3,890,897.

Stevens, Orlando J., to United States of America, Navy. Semi-automatic bearing lubricator work center. 3,891,057, Cl. 184-7.00D.

Stewart, Ronald B.: *See—*
Cheek, Thomas B.; Thornhill, Daniel E.; and Stewart, Ronald B., 3,891,982.

Stinnes, Margarete L.: *See—*
Herreshoff, L. Francis, deceased; and Vaughn, Muriel D., executrix, 3,890,915.

Stockmann, Hans H.: *See—*
Ray-Chaudhuri, Dilip K.; Georgoudis, Paul C.; and Stockmann, Hans H., 3,891,695.

Stockmann, Helmut: *See—*
Decker, Hanns; Hurtmanns, Heinz; and Stockmann, Helmut, 3,891,153.

Stoneburner, Leonard G., to Mead Corporation, The. Method of operating a drop generator that includes the step of pre-pressurizing the liquid manifold. 3,891,121, Cl. 222-1.000.

Stosberg, Herbert; Fleishmann, Horst; Reinhards, Gunter; and Engels, Siegfried, to Tente-Rollen G.m.b.H. Lockable castor, in particular swivel castor. 3,890,668, Cl. 16-35.000.

Stoy, Artur: *See—*
Vodnansky, Jiri; and Stoy, Artur, 3,890,683.

Stream, Ralph M.: *See—*
Roberson, Cletis L.; Russell, Robert G.; Stream, Ralph M.; and Leaman, Harold E., 3,890,925.

Strerath, Theo: *See—*
Scharfen, Hans; Schmitz, Karl Heinz; Strerath, Theo; and Jenko, Dragutin, 3,891,058.

Strizhenko, Vitaly Evgenievich: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.

Stroezel, Reinhold; Hettich, Alfred; and Civarella, Alfredo, to Robert Bosch G.m.b.H. Pneumatic tool construction. 3,891,049, Cl. 181-36.00A.

Stroh, Jan: *See—*
Hertz, Walter; Mentel, Jurgen; and Stroh, Jan, 3,891,814.

Structural Foam Products, Inc.: *See—*
DeVita, William R., 3,891,362.

Strukl, Joseph Stephan: *See—*
Watson, Roger William; Udelhofen, John Henry; and Strukl, Joseph Stephan, 3,891,401.

Strusinski, Mary R. Optical device. 3,891,842, Cl. 240-1.400.

Stuart, John H.: *See—*
Lawson, Gustaf Rudolph; and Stuart, John H., 3,890,858.

Stubbings, Alec Walter George: *See—*
Arnold, Raymond Mills; and Stubbings, Alec Walter George, 3,891,242.

Sturgis, Andrew C.: *See—*
United States of America, National Aeronautics and Space Administration; Hunt, Stacy R., Jr.; Homkes, Robert J.; Poteate, Wilmer B.; and Sturgis, Andrew C., 3,891,311.

Sudo, Susumu: *See—*
Saegusa, Kyuji; Sonobe, Eitetsu; and Sudo, Susumu, 3,890,746.

Sugihara, Takashi F.: *See—*
Kline, Leo; and Sugihara, Takashi F., 3,891,773.

Sugisaka, Nobuyuki, to Riker Laboratories, Inc. Process for preparation of benzoylpyridines and derivatives. 3,891,661, Cl. 260-297.00R.

Sulzle, Darwin B.: *See—*
Kerwin, Robert D.; and Sulzle, Darwin B., 3,891,984.

Sumida, Carl: *See—*
Jennings, Thomas Paul; Williamson, John Monroe; and Sumida, Carl, 3,890,951.

Sumitomo Chemical Co., Ltd.: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 3,891,638.
Okamoto, Tadashi; Kobayashi, Tsuyoshi; and Yamamoto, Hisao, 3,891,626.
Okazaki, Hiroyuki; Yuji, Isao; and Yui, Masayuki, 3,891,451.
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,891,517.

Sumitomo Electric Industries, Ltd.: *See—*
Masuda, Shigeo; and Tanaka, Toshihiko, 3,891,526.

Summers, John E.; and Rose, Gerhard, to Robertson Bauelemente G.m.b.H. Method of making protected galvanized steel sheeting. 3,891,471, Cl. 148-6.160.

Sunahara, Hiroshi; and Kimura, Yoshio, to Agency of Industrial Science & Technology. Method for paper feeding and device therefor. 3,891,205, Cl. 271-98.000.

Sunbeam Plastics Corporation: *See—*
Gach, Peter P., 3,891,110.

Sunday, William V. Plastic washboard. 3,890,812, Cl. 68-224.000.

Sundeen, Joseph E.: *See—*
Hauck, Frederic Peter; and Sundeen, Joseph E., 3,891,652.

Sundie, Richard D.; and Pennie, Walter L., to Allied Chemical Corporation. Curable amino resins. 3,891,590, Cl. 260-29.40R.

Sunstein, Drew E. Digital linearity and bias error compensating by adding an extra bit. 3,891,837, Cl. 235-152.000.

Surrette, Richard H.; and Braga, Alfred M., to Foster Grant Co., Inc. Sunglass display stand. 3,891,092, Cl. 211-13.000.

Sutton, Anthony Hubert: *See—*
Carpenter, Roland Paul; Cowie, William Pirie; Heyes, Alan; and Sutton, Anthony Hubert, 3,891,776.

Suverkropp, Geertrudes H.; and Reichrath, Werner, to Stamicarbon, N.V. 1-Ureido-5-aminocapronamide. 3,891,702, Cl. 260-553.00R.

Suzuki, Tadao; and Kawada, Hirohito, to Sony Corporation. Amplifier with signal clipping indicator and/or protective circuit. 3,891,933, Cl. 330-2.000.

Suzuki, Takaji: *See—*
Inose, Fumiyuki; Suzuki, Takaji; and Kohno, Hideki, 3,890,826.

Suzuki, Yasushi; Itaya, Toshihisa; Minami, Nobuyoshi; Tarutani, Masaaki; Miki, Tokutaro; and Miyasaka, Katsuhiko, to Teikoku Hormone MFG Co., Ltd. Naphth[2,1-d]isoxazolyl-3-diazomethyl ketones. 3,891,664, Cl. 260-307.00D.

Svenska Ackumulator Aktiebolaget Jungner: *See—*
Kinnerud, Verner Elof Johannes; and Svensson, Bernt Oskar Gerhard, 3,891,464.

Svenska Aktiebolaget Bromsregulator: *See—*
Axelsson, Lars Bengt, 3,891,067.
Severinsson, Lars Mattis; and Persson, Gert Artur, 3,891,280.

Svensson, Bernt Oskar Gerhard: *See—*
Kinnerud, Verner Elof Johannes; and Svensson, Bernt Oskar Gerhard, 3,891,464.

Swanson, Eric R. Vlf phase tracker with phase discretion. 3,891,928, Cl. 325-474.000.

Sweet, Albert: *See—*
Kaufman, Arnold S.; and Sweet, Albert, 3,890,887.

Swengel, Robert Charles, Sr.; and Crumley, J. A., to AMP Incorporated. Welding method and means using foil electrode. 3,891,789, Cl. 174-68.500.

Swett, Leo Ralph, to Abbott Laboratories. Substituted pyrazolo[3,4-e][1,4]thiazepines and isoxazolo[5,4-e][1,4]thiazepines. 3,891,630, Cl. 260-239.30B.

Swinkels, Godefridus M.: *See*—
McKay, Donald R.; and Swinkels, Godefridus M., 3,891,522.

Swiss Aluminium Ltd.: *See*—
Bichsel, Heinz F.; Furrer, Peter; and Maier, Jorg, 3,891,433.

Symmank, William D., to J. I. Case Company. Removable counterweight mounting mechanism. 3,891,095, Cl. 212-48.000.

Symonds, Gordon R.: *See*—
Gregerson, Leslie F.; and Symonds, Gordon R., 3,890,718.

Syntex Corporation: *See*—
Fried, John H.; and Harrison, Ian T., 3,891,712.

Syntex (U.S.A.) Inc.: *See*—
Bennett, John P.; Bliss, George D.; and New, Michael, 3,891,555.
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,891,766.

Synthelabo: *See*—
Plat, Michel Marie Rene; Plat, Monique, nee Berry; Cahn, Jean; and Tisseyre, Pierre Georges Christian, 3,891,640.

Szatkowski, Richard R., to Continental Can Company, Inc. Convolute wound fibre drum with thermoplastic adhesive. 3,891,135, Cl. 229-4.500.

Szczepanski, Harry. Rotatively indexed spray-painting machine. 3,890,921, Cl. 118-4.000.

Szekeres, Edward S., to United States Steel Corporation. Controlled flux addition for minimizing surface defects on continuously cast steel. 3,891,023, Cl. 164-55.000.

Sztankay, Zoltan G. Automobile collison avoidance laser system. 3,891,966, Cl. 340-53.000.

Tabata, Kazuo. Diver's harness for compressed air tank. 3,891,131, Cl. 224-25.00A.

Tachi, Seiichi: *See*—
Moriyama, Hideki; and Tachi, Seiichi, 3,891,469.

Taege, Herbert; Flus, Friedrich; and Mertens, Gunther. Porous material in a liquid development method. 3,891,434, Cl. 96-1.0LY.

Tajima, Yasutomo: *See*—
Kuwano, Nobuyori; and Tajima, Yasutomo, 3,891,236.

Takacs, Edward Francis: *See*—
Brugge, Walter James; and Takacs, Edward Francis, 3,890,899.

Takada, Takezo, to Takata Kojyo Co., Ltd. Motor vehicle safety devices. 3,891,272, Cl. 297-386.000.

Takada, Takezo, to Takata Kojyo Co., Ltd. Automatic withdrawal control mechanism for vehicle safety. 3,891,273, Cl. 297-388.000.

Takagishi, Jonathan Wayne: *See*—
Leonard, Ronald J.; and Takagishi, Jonathan Wayne, 3,891,416.

Takahara, Ichiro; Yabu, Tadahiko; and Fujita, Jihei, to Sanyo Electric Company, Ltd. Positioning and mounting means for a flexible video disk. 3,891,796, Cl. 178-6.6DD.

Takahashi, Katutoshi: *See*—
Hisamatsu, Hiroyoshi; Takahashi, Katutoshi; and Takase, Masanori, 3,891,523.

Takahashi, Kiyoshi: *See*—
Aizawa, Hiroshi; Ito, Tadashi; Itoh, Fumio; Takahashi, Kiyoshi; and Isobe, Yasuo, 3,891,312.

Takase, Masanori: *See*—
Hisamatsu, Hiroyoshi; Takahashi, Katutoshi; and Takase, Masanori, 3,891,523.

Takasugi, Kazuo: *See*—
Fujimoto, Ryoichi; Takasugi, Kazuo; Inose, Fumiyuki; Maio, Kenji; and Yokozawa, Norio, 3,890,798.

Takata Kojyo Co., Ltd.: *See*—
Takada, Takezo, 3,891,272.
Takada, Takezo, 3,891,273.

Takeda Chemical Industries, Ltd.: *See*—
Morimoto, Shiro; Nomura, Hiroaki; Fugono, Takeshi; Maeda, Kihachiro; and Ishiguro, Toshihiro, 3,891,763.
Wakae, Osamu; Yakushiji, Kunito; and Okada, Yoshiyuki, 3,891,762.

Takenouchi, Senji; Yanai, Tautomu; Matsumoto, Takamasa; and Ohtani, Hiroyoshi, to Ishikawajima-Harima Jukogyo Kubushiki. Scaffolding unit for shipbuilding. 3,891,051, Cl. 182-63.000.

Takeshita, Shigeru: *See*—
Adachi, Kazuma; Tokunaga, Masayoshi; and Takeshita, Shigeru, 3,891,350.

Takeuchi, Yukihisa: *See*—
Noda, Fumiyoshi; and Takeuchi, Yukihisa, 3,891,009.

Takiura, Mamoru, to Ikegai Tekko Kabushiki Kaisha. Apparatus for the high-pressure cross-linking molding of polymers. 3,891,372, Cl. 425-244.000.

Tallman, Erven. Method of making a hydraulic jack. 3,890,684, Cl. 29-156.40R.

Talsma, Tjitte, to U.S. Philips Corporation. Device for the display of colour television images. 3,891,951, Cl. 335-210.000.

Tamaki, Mituo; Ninomiya, Yasumasa; Koyama, Tatsuo; and Ishige, Ryouhei, to Hitachi, Ltd.; and Japanese National Railways. Storage with automatic handling means for storing articles. 3,891,100, Cl. 214-38.0CA.

Tamura, Hidemasa: *See*—
Yanagisawa, Yuzuru; and Tamura, Hidemasa, 3,891,873.

Tamura, Hitoshi: *See*—
Muto, Eiji; Kawarabayashi, Tsuneo; Matsumura, Koichi; and Tamura, Hitoshi, 3,891,465.

Tanabe, Masato, to Schering Corporation. 17α,20,20,21-Bismethylenedioxy-4,5-seco-3-pregnyne-5-ones. 3,891,677, Cl. 260-340.900.

Tanaka, Toshihiko:.*See*—
Masuda, Shigeo; and Tanaka, Toshihiko, 3,891,526.

Tanaka, Yoshiaki: *See*—
Matsuda, Kazuo; Tanaka, Yoshiaki; and Sakai, Takeyo, 3,891,715.

Tarbox, John W.; Hinds, Walter E.; and Castro, Rodolfo, to Hughes Aircraft Company. System for dispensing and cutting strand material. 3,890,865, Cl. 83-198.000.

Tarman, Paul B.: *See*—
Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,403.
Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, 3,891,404.

Tarutani, Masaaki: *See*—
Suzuki, Yasushi; Itaya, Toshihisa; Minami, Nobuyoshi; Tarutani, Masaaki; Miki, Tokutaro; and Miyasaka, Katsuhiko, 3,891,664.

Taub, David: *See*—
Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., 3,891,676.

Tausch, Gilbert H.; and Pringle, Ronald E., to Camco, Incorporated. Apparatus for installing and removing flow control devices. 3,891,032, Cl. 166-117.500.

Tausch, Harry W., to Goodyear Tire & Rubber Company, The. Nonsettling rubber chemical composition and method of preparing said composition. 3,891,588, Cl. 260-29.70R.

Taylor, A. Hadley. Ramp attachment for wheel chair. 3,891,268, Cl. 297-217.000.

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Miller, Gary E., 3,890,740.

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Wimmer, Gunter; Wilisch, Jurgen; and Heller, Jurgen, 3,891,222.

Teed, Richard K., to Riegel Textile Corporation. Apparatus for intermittently applying deposits of adhesive onto a moving web of material. 3,890,926, Cl. 118-325.000.

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Teikoku Hormone MFG Co., Ltd.: *See*—
Suzuki, Yasushi; Itaya, Toshihisa; Minami, Nobuyoshi; Tarutani, Masaaki; Miki, Tokutaro; and Miyasaka, Katsuhiko, 3,891,664.

Telecommunications Radioelectriques T.R.T.: *See*—
Daguet, Jacques Lucien; Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, 3,891,803.

Telecredit, Inc.: *See*—
Goldman, Robert N., 3,891,830.

Teledyne Industries, Inc.: *See*—
Kirkpatrick, Burnard M.; and Moore, James C., 3,891,050.

Telefunken Patentverwertungsgesellschaft mbH: *See*—
Kaiser, Reinhold, 3,891,481.

Telephon-und Telegraphen-Fabriks Aktiengesellschaft Kapsch & Sohne In Wien: *See*—
Karobath, Ernst; and Rippel, Leopold, 3,891,463.

Telesco Brophey Limited: *See*—
Schafer, Josef, 3,890,990.

Telex Computer Products, Inc.: *See*—
Patterson, Irvin L., 3,891,921.

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Oigarden, Tarald H.; Teltscher, Erwin S.; and Gross, Robert D., 3,891,985.

Templeman, John Joseph, to British Gas Corporation. Jet boosters. 3,891,353, Cl. 417-183.000.

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Hatta, Akihiro, 3,890,766.

Tenconi, Riccardo. Circular knitting machine with pneumatic thread feeding devices. 3,890,809, Cl. 66-132.00R.

Tente-Rollen G.m.b.H.: *See*—
Stosberg, Herbert; Fleishmann, Horst; Reinhards, Gunter; and Engels, Siegfried, 3,890,668.

Terada, Hideto, to Sintokogio, Ltd. Transferring device for objects in which a reduced pressure is applied continuously. 3,891,096, Cl. 214-1.0BB.

Terrell, Jamie B.: *See*—
Owen, Harrold D.; and Terrell, Jamie B., 3,891,034.

Terry, Rupert Douglas, to Johns-Manville Corporation. Apparatus for slitting positioning and wrapping tubular objects. 3,891,493, Cl. 156-455.000.

Teves-Thompson GmbH: *See*—
Schonlau, Herbert; and Meyerhoff, Walter, 3,890,943.

Texaco Inc.: *See*—
Carley, Don A.; and Crookshank, Fred T., 3,891,564.
Hughes, James W., 3,891,602.
Meador, Richard A.; Arnold, Richard H.; and Paap, Hans J., 3,891,916.
Nelson, Gerald Verdell; and Wray, Glenn Cooper, 3,891,539.
Palmer, Harold A.; and Sample, Thomas E., Jr., 3,891,655.
Richter, Albert P., Jr., 3,891,251.

Textilana Corporation: *See*—
Ernst, Robert; and Miller, Eugene J., 3,891,682.

Textron Inc.: *See*—
Maynard, George A., 3,891,087.

Rose, Lloyd E., 3,890,727.
Thaler, Richard, to Sprecher & Schuh AG. High-voltage power switch. 3,891,893, Cl. 317-11.00A.
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Theiss, Armin: *See—*
Schmidt, Gunther; Theiss, Armin; Dederra, Carl-Helmut; and Kaiser, Leonhard, 3,890,781.
Thiokol Corporation: *See—*
Ehrlick, Robert; and Young, Archie R., II, 3,891,686.
Thoma, Jozef A.: *See—*
Verheijen, Egidius J. M.; Thoma, Jozef A.; and Deumens, Johannes J. M., 3,891,678.
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Lavarini, Bernard; Crancon, Jean-Pierre; and Thomas, Jean-Yves, 3,891,944.
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Thominet, Michel Leon, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France. N-(2-pyrrolidyl or piperidyl alkyl)-4-hydroxy benzamides. 3,891,671, Cl. 260-326.470.
Thompson, Ralph F.: *See—*
Fassett, Donald G.; and Thompson, Ralph F., 3,890,646.
Thomson-CSF: *See—*
Destrade, Michel; and Vassort, Jean-Luc, 3,891,948.
Thornhill, Daniel E.: *See—*
Cheek, Thomas B.; Thornhill, Daniel E.; and Stewart, Ronald B., 3,891,982.
Thorsell, Sven Torgny, to Linden-Alimak AB. Device for inserting drains into the ground. 3,891,186, Cl. 254-29.00R.
Thorwaldsen, Stanley E.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; Smith, Frederick; McElroy, David C.; and Dunton, Roy P., 3,890,772.
Thyssen Niederrhein AG Hutten- und Walzwerke: *See—*
Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, 3,891,196.
Tiede, Clair L. Bicycle propelling means. 3,891,044, Cl. 180-31.000.
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Tilg, Robert: *See—*
Maier, Elmar; Tilg, Robert; and Walser, Karl, 3,891,133.
Tims, Allan C.: *See—*
Henriquez, Theodore A.; and Tims, Allan C., 3,891,871.
Tisdale, Lawrence H., to Raytheon Company. Electron discharge device having electron multipactor suppression coating on window body. 3,891,884, Cl. 313-107.000.
Tisdale, Robby R.; Rollison, Leon C.; and Hall, Ben F., to Southern Weaving Company. Filling detecting device for narrow fabric loom. 3,891,011, Cl. 139-372.000.
Tisseyre, Pierre Georges Christian: *See—*
Plat, Michel Marie Rene; Plat, Monique, nee Berry; Cahn, Jean; and Tisseyre, Pierre Georges Christian, 3,891,640.
Tjurin, Jury Grigorievich: *See—*
Shapiro, Aron Beniaminovich; Chernyavsky, Vladimir Pavlovich; Kadi-Ogly, Ibragim Akhmedovich; and Tjurin, Jury Grigorievich, 3,891,877.
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Hertrick, Thomas P.; Mitiska, James L.; and Tobacman, Leo, 3,891,164.
Todt, Hans-Gunther; and Voss, Gunter, to Schering AG. Acid, galvanic zinc bath. 3,891,520, Cl. 204-55.00R.
Tokumoto, Toshiyuki. Electrostatic separating apparatus. 3,891,537, Cl. 204-308.000.
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Adachi, Kazuma; Tokunaga, Masayoshi; and Takeshita, Shigeru, 3,891,350.
Tomita, Sadami; Chiba, Akio; and Miyajima, Goh, to Hitachi, Ltd. Pole piece for producing a uniform magnetic field. 3,891,475, Cl. 148-31.550.
Torresi, Vincenzo N., to Ing. C. Olivetti & C., S.p.A. Drive circuit for a liquid crystal display. 3,891,981, Cl. 340-324.00M.
Torsten, Bo Goran, to Kommanditbolaget United Stirling AB & Co. Stirling cycle engine with common heat exchanger housing. 3,890,785, Cl. 60-525.000.
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Segawa, Kazuyoshi, 3,891,126.
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Fukushima, Mitsuru; Inaba, Yoshihito; Kobari, Sadami; and Morishita, Masataka, 3,891,570.
Toyo Kogoyo Co., Ltd.: *See—*
Shibagaki, Masao; and Oonishi, Masayoshi, 3,890,947.
Toyo Kogyo Co., Ltd.: *See—*
Yoshino, Tsutomu, 3,891,406.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Goto, Kenji; and Ishikawa, Norikatsu, 3,890,945.
Miyake, Joji; and Nakakobara, Takeshi, 3,891,361.
Noda, Fumiyoshi; and Takeuchi, Yukihisa, 3,891,009.
Track Pack Corporation: *See—*
Roe, Harry James, 3,891,342.
Tracto Technik Paul Schmidt: *See—*
Schmidt, Paul, 3,891,036.
Traficant, Charles. High lift mechanism. 3,891,108, Cl. 214-512.000.
Traimond, Antoine: *See—*
Camion, Jean; Campot, Etienne; Conneau, Jean; Contival, Serge; Dejoux, Andre; Detton, Jean; Gournelle, Maurice; and Traimond, Antoine, 3,890,824.
Trainor, Maurice J.; and Riddle, Charles F., to Rexnord Inc. Wear balanced cleat for compaction wheel. 3,891,341, Cl. 404-121.000.
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Snoberger, Robert C.; Delker, Thomas C.; and Reschly, Richard L., 3,891,231.
Travor, Bruce W.; and Brown, Samuel L., to United States of America, Army. Projectile. 3,890,902, Cl. 102-93.000.
Trease, Ralph E., to Owens-Illinois, Inc. Solvents and vehicles for micro-circuitry pastes and pastes made therefrom. 3,891,450, Cl. 106-26.000.
Tremarco, Emelio. Model airplane adjustable motor mount. 3,891,169, Cl. 248-5.000.
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Schimitschek, Erhard J.; Trias, John A.; and Celto, John E., 3,891,569.
Tritronics (1971) Ltd.: *See—*
White, Herbert Montgomery, 3,891,962.
Triumph Werke Nurnberg A.G.: *See—*
Jung, Friedrich, 3,891,078.
Trostmann, Erik; and Fensvig, Jens Andreas Toft, to Instituttet for Produktudvikling. Apparatus for measuring a fluid flow rate. 3,890,839, Cl. 73-199.000.
TRW Inc.: *See—*
Herbenar, Edward J., 3,891,336.
Maxwell, Jerome Eugene, 3,891,973.
Oicles, Jeffrey A., 3,891,046.
Romeo, Donald E.; and MacMillan, Archie J., 3,891,936.
Tsuchimoto, Takashi: *See—*
Ito, Katsuhiko; and Tsuchimoto, Takashi, 3,891,468.
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Tsuji, Yoshikazu; and Sohma, Yukio, to Fujitsu Limited. Coding system for differential phase modulation. 3,891,959, Cl. 340-146.1AQ.
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Tsukiyasu, Tadashi: *See—*
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,891,517.
Tsunoda, Yoshito, to Hitachi, Ltd. Apparatus for making hologram. 3,891,300, Cl. 350-3.500.
Tubeue, Jean Andre Georges, to Societe Europeenne de Propulsion. Thermohydraulic engines. 3,890,784, Cl. 60-516.000.
Tuffias, Robert H., to Litton Systems, Inc. Lubricated assemblies. 3,891,282, Cl. 308-9.000.
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Morris, Horton Harold; Drexel, Richard Jacob, Jr.; and Turner, Kenneth Lamar, 3,891,580.
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Watson, Roger William; Udelhofen, John Henry; and Strukl, Joseph Stephan, 3,891,401.
Ueda, Hiroshi; and Kuramoto, Yoshio, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera. 3,891,992, Cl. 354-152.000.
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Ullman, John E., to Huntington Industries Incorporated. Packaging Machine and method. 3,890,763, Cl. 53-39.000.
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Under Sea Industries, Inc.: *See—*
Roberts, Robert E., 3,890,662.
Union Carbide Corporation: *See—*
Colpoys, Patrick J., 3,891,565.
Kozak, Theodore F., 3,890,974.
Langkau, John Frank, 3,891,462.
Nausedas, Joseph A., 3,890,675.
Union Oil Company of California: *See—*
Block, Michael J.; and Young, Donald C., 3,891,743.
United Kingdom Atomic Energy Authority: *See—*
North, John Malcolm; and Wilks, Ronald Spencer, 3,891,735.

United States Gypsum Company: *See—*
Williams, Terrance L., 3,891,453.
U.S. Industries, Inc.: *See—*
Cook, William J.; and Ellens, Gordon A., 3,891,274.
U.S. Medical Research & Development, Inc.: *See—*
Greenspan, Donald J., 3,890,954.
United States of America
Agriculture: *See—*
Arthur, Jett C., Jr.; and Bains, Malkait S., 3,891,621.
Kline, Leo; and Sugihara, Takashi F., 3,891,773.
Lambou, Madeline G.; Spadaro, James J.; and Rusch, Eunice M., 3,891,571.
Parkin, Bernard A., Jr.; and Schuller, Walter H., 3,891,612.
Shackelford, Albert D.; Holladay, John H.; and Lloyd, E. J., 3,891,097.
Verburg, Gerald B.; Frick, John G., Jr.; and Reid, John D., 3,891,389.
Air Force: *See—*
Carr, Paul H.; and Budreau, Alan J., 3,891,929.
Day, Douglas B.; and Stahl, Welfred A., 3,891,165.
Harada, Yoshiro; and Hed, A. Z., 3,891,461.
Hohman, Alvin E.; and Lively, Gerald W., 3,891,456.
Kerwin, Robert D.; and Sulzle, Darwin B., 3,891,984.
Schlossberg, Howard; and Milam, David, 3,891,945.
Army: *See—*
Brown, Robert S.; and Muzzy, Raymond J., 3,891,482.
Gould, William I., Jr., 3,890,900.
Looger, Lonnie L.; and Vickers, Wiley B., 3,890,879.
Roberts, Thomas G.; Barr, Thomas A., Jr.; and Rust, Charles M., 3,891,941.
Ryan, Maurice A.; and Barron, Morton A., 3,891,323.
Travor, Bruce W.; and Brown, Samuel L., 3,890,902.
Vilms, Juri, 3,890,699.
Wolterman, William G., 3,891,162.
General Counsel-Code GP: *See—*
Dimeff, John, 3,891,925.
Interior: *See—*
Cole, Ernest R., Jr.; Dressel, Waldemar M.; and Smith, Lawrence L., 3,891,430.
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Auer, Siegfried O. Impact position detector for outer space particles. 3,891,851, Cl. 250-385.000.
Levin, Herman; Auker, Byron H.; and Gardos, Michael N. Refractory porcelain enamel passive control coating for high temperature alloys. 3,891,452, Cl. 106-48.000.
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Hunt, Stacy R., Jr.; Homkes, Robert J.; Poteate, Wilmer B.; and Sturgis, Andrew C. Multiparameter vision testing apparatus. 3,891,311, Cl. 351-38.000.
Navy: *See—*
Anderson, Matthew E.; and Redmond, Stephen L., 3,890,901.
Cusick, John H.; Brown, Alvin E.; Hamamoto, Al S.; and Bellin, Jack L. S., 3,890,831.
Drisko, Richard W.; and Crilly, Joseph B., 3,891,583.
Ellingson, Herman E.; and Lieberman, Gilbert, 3,890,913.
Erickson, Porter W.; and Hellfritzsch, Alvin G., 3,891,466.
Funk, Clarence J., 3,891,859.
Gardner, Paul C., 3,890,914.
Haisfield, Rudolph M., 3,891,961.
Henriquez, Theodore A.; and Tims, Allan C., 3,891,871.
Jensen, Garold K., 3,891,987.
Malloy, Richard J., 3,890,840.
Opdahl, Everett W.; and Kim, Chang-Kyo, 3,890,919.
Picard, Salvatore R.; and Starry, Robert F., 3,891,865.
Rast, Howard E.; and Caspers, Hubert H., 3,891,559.
Ryan, Charles C.; Siedband, Melvin D.; and Fuchs, Abraham M., 3,891,988.
Schimitschek, Erhard J.; Trias, John A.; and Celto, John E., 3,891,569.
Stevens, Orlando J., 3,891,057.
Widener, Maurice W., 3,891,960.
Wilkerson, Joseph B.; and Linck, Drew W., 3,891,163
U.S. Philips Corporation: *See—*
Bockelmann, Paul; and Aschermann, Wilfried, 3,891,937.
Debost, Jean-Pierre; and de Malartic, Jacques Mezan, 3,891,947.
Essers, Wilhelmus Gerardus; and Jelmorini, Gerardus, 3,891,824.
Hiele, Adrianus Leonardus, 3,891,815.
Janssen, Peter Johannes Hubertus; van Hattum, Johannes Simon Albert; and Korver, Jan Abraham Cornelis, 3,891,800.
Kleis, Derk, 3,891,809.
Naastepad, Pieter Aart, 3,891,476.
Talsma, Tjitte, 3,891,951.
Tietjens, Eduard Willem, 3,890,705.
Tietjens, Eduard Willem, 3,890,709.
United States Steel Corporation: *See—*
Grange, Raymond A., 3,891,474.
Szekeres, Edward S., 3,891,023.
Unitek Corporation: *See—*
Laub, Joseph L.; and Hurst, John F., 3,891,822.
University of Akron, The: *See—*
Farona, Michael F.; and White, James F., 3,891,713.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr., 3,891,666.
Urushida, Yoshihisa, to Citizen Watch Company Limited. Watch with solar cell unit. 3,890,776, Cl. 58-23.00C.
Usines Decoufle: *See—*
Verjux, Jean, 3,890,866.
USM Corporation: *See—*
Babson, Edward S.; Brennan, John W.; Gorini, Robert F.; and Mason, Ronald C., 3,890,911.
Hanson, Raymond, 3,890,664.
Zemlin, John C., 3,891,785.
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Valjoux S.A.: *See—*
Capt, Edmond; and Gander, Gerald, 3,890,779.
Valmet O. Y.: *See—*
Kankaanpaa, Matti, 3,891,500.
Valspar Inc.: *See—*
Peterson, Marvin A.; Good, Adrian J.; and Kurek, Thaddeus P., 3,891,601.
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Valvassori, Alberto: *See—*
Severini, Febo; Valvassori, Alberto; and Pagliari, Alberto, 3,891,720.
Van Dorn Company: *See—*
Dragomier, John D.; and Zysset, Edgar H., 3,891,117.
Van Mark Products Corporation: *See—*
Van Cleave, Eugene, 3,890,869.
Van Cleave, Eugene, 3,890,870.
Van Brussell, Marcel A.; and Julia-Polle, Raymond Louis, to International Standard Electric Corporation. Dial pulse receiver. 3,891,808, Cl. 179-16.0EA.
Vance Industries, Inc.: *See—*
Carrigan, James David, 3,891,194.
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Van Der Veen, Romke: *See—*
De Koning, Jan; and Van Der Veen, Romke, 3,890,791.
Van Esch, Robert Florent: *See—*
Bollen, Romain Henri; and Van Esch, Robert Florent, 3,891,852.
van Hattum, Johannes Simon Albert: *See—*
Janssen, Peter Johannes Hubertus; van Hattum, Johannes Simon Albert; and Korver, Jan Abraham Cornelis, 3,891,800.
Van Horne, William J. Deflector ball game apparatus. 3,891,210, Cl. 273-30.000.
Vanlerberghe, Guy: *See—*
Kalopissis, Gregoire; Viout, Andre; and Vanlerberghe, Guy, 3,891,385.
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Van Steenput, Andre: *See—*
Sievers, Willi; and Van Steenput, Andre, 3,891,363.
Vapor Corporation: *See—*
McInerney, Michael J.; Brady, Robert T.; and Phillips, Alvia E., 3,890,936.
Varsanyi, Denis: *See—*
Drabek, Jozef; and Varsanyi, Denis, 3,891,728.
Vasas, Martin M., to Bridgeport Metal Goods Manufacturing Company, The. Sealing gland for product container. 3,891,330, Cl. 401-122.000.
Vassort, Jean-Luc: *See—*
Destrade, Michel; and Vassort, Jean-Luc, 3,891,948.
Vaughan, Richard L.: *See—*
United States of America, National Aeronautics and Space Administration; Putnam, David F.; and Vaughan, Richard L., 3,891,533.

Vaughn, Muriel D., executrix: *See—*
Herreshoff, L. Francis, deceased; and Vaughn, Muriel D., executrix, 3,890,915.

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Pilewski, John J.; Plotz, Lawrence F.; and Pruisman, Richard A., 3,891,375.

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Richter, Sidney B.; and Barnas, Eugene F., 3,891,687.
Richter, Sidney B.; and Barnas, Eugene, 3,891,701.

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Fleissner, Hans, 3,890,811.

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Verburg, Gerald B.; Frick, John G., Jr.; and Reid, John D., to United States of America, Agriculture. Shrinkage-control treatment for knitted fabrics. 3,891,389, Cl. 8-149.200.

Vereinigte Deutsche Metallwerke AG: *See—*
Stawicky, Wolfgang; and Ossig, Horst, 3,891,426.

Verheijen, Egidius J. M.; Thoma, Jozef A.; and Deumens, Johannes J. M., to Stamicarbon, B.V. Preparation of alkylated or non-alkylated dihydrocoumarin together with the corresponding alkylated, or non-alkylated, coumarin. 3,891,678, Cl. 260-343.20R.

Verjux, Jean, to Usines Decoufle. Device for cutting a continuous strip of paper. 3,890,866, Cl. 83-346.000.

Vickers, Wiley B.: *See—*
Looger, Lonnie L.; and Vickers, Wiley B., 3,890,879.

Victor Company of Japan, Limited: *See—*
Watanabe, Yasuaki, 3,891,867.

Viehbach, Hans-Dieter: *See—*
Kraus, Werner; and Viehbach, Hans-Dieter, 3,890,953.

Vilms, Juri, to United States of America, Army. Method of making an ohmic contact to a semiconductor material. 3,890,699, Cl. 29-590.000.

Vinals, Joaquin Francisco; Quinn, Alton Dewitt; and Pittet, Alan Owen, to International Flavors & Fragrances Inc. Novel process for altering the organoleptic properties of tobacco using one or more alpha-pyrones and process. 3,890,981, Cl. 131-144.000.

Viout, Andre: *See—*
Kalopissis, Gregoire; Viout, Andre; and Vanlerberghe, Guy, 3,891,385.

Virginio Rimoldi & C. S.p.A.: *See—*
Marforio, Nerino, 3,891,812.

Vlemmings, Jan: *See—*
Dworak, Wilhelm; Jons, Claus; and Vlemmings, Jan, 3,891,360.

Voaden, Arthur Trevor, to Imperial Chemical Industries Limited. Process for shaping polytetrafluoroethylene sheet. 3,891,736, Cl. 264-92.000.

Vockenhuber, Karl: *See—*
Muszumanski, Trude; Kurz, Gunter; and Wendisch, Irngard, 3,891,304.

Vodnansky, Jiri; and Stoy, Artur, to Ceskoslovenska akademie Ved No. 3 Narodni. Roller with an elastic hydrogel layer for dye application or printing on glass and other materials. 3,890,683, Cl. 29-132.000.

Vogt, Ulrich, to Daimler-Benz Aktiengesellschaft. Sliding bearing. 3,891,287, Cl. 308-237.00A.

Vohringer, Gerd: *See—*
Rometsch, Werner; Robeller, Walter; Lutz, Gerhard; Reichel, Eckehart; Bosch, Paul; and Vohringer, Gerd, 3,890,883.

Volz, Frederic E. Multi-channel sun photometer. 3,891,326, Cl. 356-222.000.

von Klenck, Jurgen; Michel, Erich; and Gerstenacker, Klaus-Dieter, to Mannesmann-AG. Method and apparatus for pyrolytically reducing waste. 3,890,908, Cl. 110-8.00R.

Vorbruggen, Helmut; and Niedballa, Ulrich, to Schering Aktiengesellschaft. Process for preparing cytidines. 3,891,623, Cl. 260-211.50R.

Voss, Gunter: *See—*
Todt, Hans-Gunther; and Voss, Gunter, 3,891,520.

Vuceta, Ivan N.: *See—*
Grabovac, Bosko; and Vuceta, Ivan N., 3,890,859.

W. A. Scholten's Chemische Fabrieken B.V. of W. A.: *See—*
Verberne, Petrus, 3,890,888.

W. R. Grace & Co.: *See—*
D'Entremont, Donald J., 3,891,008.
Hurst, John, 3,891,732.
Welch, Mary Jeanne, 3,891,327.

W. Schlafhorst & Co., Maschinenfabrik: *See—*
Socha, Johannes; and Groth, Wolfgang, 3,890,807.

Waagner-Biro Aktiengesellschaft: *See—*
Beckmann, Georg; and Gilli, Paul Viktor, 3,890,789.

Waddan, Dhafir Yusuf, to Imperial Chemical Industries Limited. Hydrogenation process. 3,891,707, Cl. 260-583.00K.

Waddell, Bennett N.: *See—*
Girard, William T.; Hamilton, Thomas R.; and Waddell, Bennett N., 3,890,726.

Wade, William D., to King Engineering Corporation. Filter and sorbent cartridge. 3,891,417, Cl. 55-274.000.

Wagner, Edmund. Concrete reinforcement. 3,890,756, Cl. 52-648.000.

Wahl, Josef, to Robert Bosch G.m.b.H. Method and system to reduce noxious components in the exhaust emission from internal combustion engines with carburetor supply. 3,890,946, Cl. 123-119.00R.

Wailes, Rodney A.: *See—*
Grove, Marvin H.; and Wailes, Rodney A., 3,890,991.

Wakabayashi, Takashi, to Matsushita Electric Industrial Co., Ltd. Humidity sensor. 3,891,958, Cl. 338-35.000.

Wakae, Osamu; Yakushiji, Kunito; and Okada, Yoshiyuki, to Takeda Chemical Industries, Ltd. Method for combatting bacterial plant diseases using 2-amino-1,3,4-thiadiozoles. 3,891,762, Cl. 424-270.000.

Walcott, Frank R. Water collection and storage dispersion apparatus. 3,890,934, Cl. 119-78.000.

Walker, Richard A., to Kollmorgen Corporation. Photometric device for printer light source and the like. 3,891,317, Cl. 355-68.000.

Walkey, John E., to Chevron Research Company. Integrated hydrocarbon conversion process. 3,891,538, Cl. 208-50.000.

Walkup, Lewis E., to Xerox Corporation. Xerographic developing apparatus. 3,890,929, Cl. 118-637.000.

Wallace-Murray Corporation: *See—*
Woollenweber, William E., Jr., 3,891,349.

Walser, Karl: *See—*
Maier, Elmar; Tilg, Robert; and Walser, Karl, 3,891,133.

Wander Ltd.: *See—*
Schmutz, Jean; Hunziker, Fritz; and Kunzle, Franz Martin, 3,891,647.

Wang, Kuei-Seng, to Quindar Electronics, Inc. Four-way four-wire active bridge. 3,891,801, Cl. 179-1.0CN.

Ward, Ronald L.: *See—*
Herr, Kurt F.; Heck, Dennis A.; Lesny, Lucian J.; and Ward, Ronald L., 3,891,838.

Ware Machine Service, Inc.: *See—*
Pilch, John S., 3,891,104.

Warncke, Ernst, to Dragerwerk Aktiengesellschaft. Window shield for respiratory mask and protective helmuts. 3,890,647, Cl. 2-9.000.

Warner-Lambert Co.: *See—*
Ferraro, Frank A., 3,890,704.

Warren, Don R.; and Busse, Louis W., to Clinical Convenience Products, Inc. CO_2 generating tablet for culture devices. 3,891,509, Cl. 195-109.000.

Warsinski, Robert, to Ford Motor Company. Cooling curve computer. 3,891,834, Cl. 235-151.300.

Wasson, Burton Kendall, to Merck Sharp & Dohme (I.A.) Corporation. 4-[3-Amino-2-acyloxypropoxy]-1,2,5-thiadiazole compounds. 3,891,639, Cl. 260-247.10H.

Watanabe, Atsumi, to Hitachi, Ltd. Automatic pulse phase shifter for A.C.-D.C. or D.C.-A.C. converter. 3,891,912, Cl. 321-16.000.

Watanabe, Tamotsu, to Nippon Kogei Kogyo Company, Limited. Electrostatic dust collector for exhaust gases containing fine particles. 3,891,415, Cl. 55-122.000.

Watanabe, Yasuaki, to Victor Company of Japan, Limited. Variable impedance circuit. 3,891,867, Cl. 307-264.000.

Watari, Shinjiro: *See—*
Kobayashi, Kazuo; Watari, Shinjiro; Kato, Tsutomu; Shiraishi, Minoru; and Kawana, Yoshio, 3,891,574.

Watson, Donald W., to Xerox Corporation. Article labeling apparatus and label form therefor. 3,891,492, Cl. 156-351.000.

Watson, George R.: *See—*
Rowse, Robert A.; and Watson, George R., 3,891,408.

Watson, Roger William; Udelhofen, John Henry; and Strukl, Joseph Stephan, to Standard Oil Company. Reducing deposits and smoke from jet fuels. 3,891,401, Cl. 44-68.000.

Watts, William A., to Goodyear Tire & Rubber Company, The. Synergistic antiblock systems for an ethylene/vinyl acetate copolymer. 3,891,587, Cl. 260-28.5AV.

Wauson, Warren C., to Halliburton Company. Variable set point speed control for hydrostatic transmissions. 3,890,782, Cl. 60-327.000.

Wean United, Inc.: *See—*
Gerretz, Josef; and Zeunert, Fritz, 3,890,821.

Weber, Karl-Heinz; and Dinkelbach, Anton, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Device for monitoring the temperature of rotating machine parts. 3,891,861, Cl. 307-117.000.

Weeks, Lorne E.; and Doran, Ronald W., to Intermountain Research and Development Corporation. Apparatus for slurrying soda ash. 3,891,393, Cl. 23-271.00R.

Weidenbach, Gunter: *See—*
Brautigam, Hans; Weidenbach, Gunter; and Koepernik, Karl Hermann, 3,891,575.

Weidman, William K.: *See—*
Zimmer, George A; Aliaben, Charles M., Jr.; and Weidman, William K., 3,891,286.

Weil, Edward D., to Stauffer Chemical Company. Fire retardant phosphorus oligomer compositions. 3,891,727, Cl. 260-928.000.

Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, to Institute of Gas Technology. Oil shale hydrogasification process. 3,891,403, Cl. 48-197.00R.

Weil, Sanford A.; Tarman, Paul B.; and Punwani, Dharamvir, to Institute of Gas Technology. Heavy oil hydrogasification process. 3,891,404, Cl. 48-213.000.

Weisz, John J.: *See—*
Miloscia, William J.; Weisz, John J.; and Planz, Paul E., 3,891,722.

Welch Allyn, Inc.: *See—*
Moore, William C.; Connors, John D.; and Newman, Richard W., 3,890,961.

Welch, Mary Jeanne, to W. R. Grace & Co. Mounted slides and method of securing a cover glass to a glass slide having a specimen thereon. 3,891,327, Cl. 356-244.000.

Well, Dale E.; and Marley, Kenneth C. Remotely operated seafloor coring and drilling method and system. 3,891,037, Cl. 175-6.000.

Wells, John B., to Xerox Corporation. Imaging process using donor material. 3,891,990, Cl. 346-74.00E.

Wendisch, Irngard: *See—*
Muszumanski, Trude; Kurz, Gunter; and Wendisch, Irngard, 3,891,304.

Wendler, Norman L.: *See—*
Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., 3,891,676.

Wendorff, Jochen: *See—*
Forster, Eckehard; Richter, Helmut; Spetzler, Edgar; Wendorff, Jochen; Klapdar, Wilhelm; and Rommerswinkel, Heinrich-Wilhelm, 3,891,196.

Werkzeugmaschinenfabrik Oerlikon Buhrle & Co.: *See—*
Hurlemann, Ernst; and Zellweger, Jurg, 3,890,881.
Kotthaus, Erich, 3,891,407.

Werner, Peter; and Drews, Ulrich, to Robert Bosch G.m.b.H. Electronic ignition system with automatic ignition advancement and retardation. 3,890,944, Cl. 123-117.00R.

Werner & Pfleiderer: *See—*
Pleva, Harry, 3,890,828.

Wessel, Josef. Centrifugal sifter apparatus. 3,891,543, Cl. 209-144.000.

Wessel, Otto; Hofmann, Georg; Gesell, Hartmut; and Scholz, Werner, to Mannesmann Aktiengesellschaft. Method for making metal powder. 3,891,730, Cl. 264-11.000.

Western Electric Company, Inc.: *See—*
Dabby, Franklin Winston; and Kestenbaum, Ami, 3,891,302.

Westinghouse Brake & Signal Co. Ltd.: *See—*
Newson, John Chase, 3,891,909.

Westinghouse Electric Corporation: *See—*
Angus, John H., 3,891,094.
Braytenbah, Andrew S., 3,891,344.
Clark, James O., 3,891,064.
De Corso, Serafino M., 3,891,828.
Felice, Patrick E.; and Ferber, Robert R., 3,891,849.
Horton, William E., III, 3,891,955.
Perry, Robert H., 3,891,167.
Rhoton, Richard S.; and McDonald, Michael P., 3,891,833.
Rushing, Frank C., 3,891,299.
Yannone, Robert A.; and Kiscaden, Roy W., 3,891,915.
Yoon, Kue H.; Friedrich, Robert E.; and Sletten, Andreas M., 3,891,813.
Yorgin, Nick; and Maier, Alfred E., 3,891,298.

Wettstein, Gottlieb: *See—*
Ullmann, Werner; Schumacher, Bernd; Sieg, Arno; Mattei, Silvano; Fenner, Hans-Ueli; Wettstein, Gottlieb; and Ruh, Herbert, 3,891,819.

Weyerhaeuser Company: *See—*
Selden, Robert W.; and Schein, Edward W., 3,890,759.

Whirlpool Corporation: *See—*
Braga, Albert T.; Brenner, Robert A.; and Odle, Ralph S., Jr., 3,890,719.
Marcussen, Henry; and Marcade, Rogue D., 3,890,987.
Marcussen, Henry, 3,891,548.
Nichols, George V., 3,890,720.
Sisk, George William, Jr., 3,890,799.

White, Alan Chapman, to John Wyeth and Brother (Ltd.). 10,10-Disubstituted-2,3,4,10-tetrahydro-and 1,2,3,4,10a-hexahydropyrimidol [1,2-a]indole derivatives. 3,891,644, Cl. 260-251.00A.

White, Charles S. Structural bearing element having a low friction surface and method. 3,891,488, Cl. 156-170.000.

White, Herbert Montgomery, to Tritronics (1971) Ltd. Electronic insect controller. 3,891,962, Cl. 340-15.000.

White, James F.: *See—*
Farona, Michael F.; and White, James F., 3,891,713.

White Metal Rolling & Stamping Corporation: *See—*
Larson, Clayton E., 3,891,054.

White-Westinghouse Corporation: *See—*
Bebinger, Jack E., 3,891,180.
Holtkamp, Calvin J., 3,891,957.

Whited, Charles A., to Xerox Corporation. Multi-process control system for an electrophotographic printing machine. 3,891,316, Cl. 355-14.000.

Whitman, Robert L.: *See—*
Korpel, Adrianus; and Whitman, Robert L., 3,890,829.

Whittle, Lee M.: *See—*
Floyd, Don D.; and Whittle, Lee M., 3,890,891.

Widener, Maurice W., to United States of America, Navy. Doppler sonar system. 3,891,960, Cl. 340-3.00R.

Wiesbock, Josef: *See—*
Hagemeister, Klaus; and Wiesbock, Josef, 3,890,780.

Wiesel, Manfred: *See—*
Sommer, Richard; Wiesel, Manfred; Otten, Hans-Gunter; and Siegel, Edgar, 3,891,619.

Wifo Wissenschaftliches Forschungs-Institut A.G.: *See—*
Jeanmaire, Peter; and Heinzer, Paul, 3,890,928.

Wikey, Arnold. Aquarium water treatment apparatus. 3,891,535, Cl. 204-275.000.

Wiklund, Klas Rudolf, to AGA Aktiebolag. Device for the non-contact length measurement of objects. 3,891,857, Cl. 250-560.000.

Wilcox, Merrill. 2-Amino-2,6-dinitrophenylhydrazines. 3,891,706, Cl. 260-569.000.

Wilfert, Karl; Barenyi, Bela; and Renner, Hermann, to Daimler-Benz Aktiengesellschaft. Roof for motor vehicles. 3,891,266, Cl. 296-137.00R.

Wilhelm, Max G.; Manning, William Truman; and O'Neil, James D., to Pillsbury Company, The. Method of extracting potato flour from waste peel and dehydrator waste. 3,891,782, Cl. 426-455.000.

Wilisch, Jurgen: *See—*
Wimmer, Gunter; Wilisch, Jurgen; and Heller, Jurgen, 3,891,222.

Wilkerson, Joseph B.; and Linck, Drew W., to United States of America, Navy. Circulation control airfoil. 3,891,163, Cl. 244-42.0CD.

Wilks, Ronald Spencer: *See—*
North, John Malcolm; and Wilks, Ronald Spencer, 3,891,735.

Willard, John J., Jr.: *See—*
Latta, Bruce M.; and Willard, John J., Jr., 3,891,387.

Willdorf, Michael E., to Material Distributors Corporation. Process for producing solar control window. 3,891,486, Cl. 156-71.000.

William H. Rorer, Inc.: *See—*
Diamond, Julius, 3,891,704.
Diamond, Julius; and Douglas, George H., 3,891,705.

Williams, Chester I. Method for pre-stressing form tie systems. 3,891,731, Cl. 264-33.000.

Williams, Kenneth S.: *See—*
Lista, Edwin L.; and Williams, Kenneth S., 3,890,877.

Williams, Olin E.: *See—*
Cox, Gordon L.; and Williams, Olin E., 3,891,429.

Williams, Richard E., to Melphor Inc. Scanning mixed base receiver. 3,891,920, Cl. 324-77.00B.

Williams, Terrance L., to United States Gypsum Company. Asbestos-free joint compounds. 3,891,453, Cl. 106-85.000.

Williamson, John Monroe: *See—*
Jennings, Thomas Paul; Williamson, John Monroe; and Sumida, Carl, 3,890,951.

Willich, Jean Herbert; and Pfeil, Christian, to August Bilstein, Firma. Hydraulic shock absorber. 3,891,199, Cl. 267-139.000.

Willmann, Norman L.: *See—*
McCartney, Charles P., Jr.; and Willmann, Norman L., 3,891,459.

Wilson, Bruce C. Kinetic memory electrodes, catheters and cannulae. 3,890,977, Cl. 128-418.000.

Wilson, Edward L.: *See—*
Nahas, Nicholas C.; and Wilson, Edward L., 3,891,402.

Wilson, Mary P. Potato chip slicing device. 3,890,867, Cl. 83-404.000.

Wilson, William P. Adjustable woven rope assembly. 3,891,257, Cl. 292-262.000.

Wilwood Inc.: *See—*
Woods, Warren L., 3,891,060.

Wimmer, Gunter; Wilisch, Jurgen; and Heller, Jurgen, to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Stylus reconditioning device. 3,891,222, Cl. 274-1.00R.

Winbigler, Paul H.: *See—*
Dulude, Donald O.; and Winbigler, Paul H., 3,891,823.

Winkler, Robert, to Escher Wyss Limited. Crystalliser with intergral pumping means. 3,891,395, Cl. 23-273.000.

Winter, Richard M.; and Aylard, William F., to Non-Ferrous International Corporation. Electromagnetic assembly resisting axial armature movement for working or finning tubing. 3,891,952, Cl. 335-258.000.

Wirkner, Eduard: *See—*
Diepers, Heinrich; Musebeck, Horst; and Wirkner, Eduard, 3,890,700.

Wiss, Oswald: *See—*
Schocher, Arno Johannes; and Wiss, Oswald, 3,891,504.

Wittlinger, Harold Allen, to RCA Corporation. Ground fault detection. 3,891,895, Cl. 317-18.00D.

Wituch, Krystyna Maria: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.

Witzel, Bruce E.; and Shen, Tsung-Ying, to Merck & Co., Inc. Biphenylenealkanoic acids. 3,891,699, Cl. 260-515.00R.

Woeste, Dieter. Container for rolled webs of goods. 3,891,136, Cl. 229-22.000.

Wokock, Ortwin; and Kaiser, Bernhard, to Kienzle Apparate GmbH. Manually activated apparatus for timing intervals of different length. 3,891,076, Cl. 194-102.000.

Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. Shaped articles made of acrylonitrile polymers containing antistatic additives. 3,891,718, Cl. 260-859.00R.

Wolf, Milton: *See—*
Sellstedt, John H.; and Wolf, Milton, 3,891,643.

Wolfe, James Richard, Jr., to du Pont de Nemours, E. I., and Company. Segmented thermoplastic copolyester elastomer. 3,891,604, Cl. 260-75.00R.

Wolfe, Paul Dillon; Saxton, Ronald Luther; and Cameron, Donald Dean, to du Pont de Nemours, E. I., and Company. Process to minimize yellowness in articles formed from acrylonitrile-styrene compositions. 3,891,609, Cl. 260-85.5HC.

Wolkowicz, Maria Waclawa: *See—*
Kotiuszko, Danuta Maria; Wituch, Krystyna Maria; Siejko, Danuta Janina; Morawska, Halina; Porowska, Natalia; Horodecka, Maria Teresa; Wolkowicz, Maria Waclawa; Nowacka, Marzena; Makarowska-Plociennik, Zofia Eliza; and Halski, Leszek, 3,891,505.

Wolsing, Wilhelm: *See—*
Musall, Reimar; and Wolsing, Wilhelm, 3,891,396.

Wolterman, William G., to United States of America, Army. Delay detonator with by-pass explosive bolt system. 3,891,162, Cl. 244-3.250.

Wolz, Werner; Bender, Hans; and Schmitt, Manfred, to Fa. Gulde-Regelarmaturen KG. Method and apparatus for safeguarding pipelines against an inadvissibly high internal compressive load by a control valve with a pneumatic drive. 3,890,992, Cl. 137-14.000.

Wood, Francis Roy: *See—*
Harris, John Derek; and Wood, Francis Roy, 3,891,881.

Wood, Robert Arnold. Pressure tank water closet system. 3,890,651, Cl. 4-26.000.

Woodrum, Guy Thomas; and Barnett, Richard E., to Calgon Corporation. Purification of dimethylaminopropylchloride hydrochloride. 3,891,708, Cl. 260-583.00N.

Woods, Warren L., to Wilwood Inc. Shoe store and shoe selection system. 3,891,060, Cl. 186-1.00R.

Woollenweber, William E., Jr., to Wallace-Murray Corporation. Cooling fan construction and method of making same. 3,891,349, Cl. 416-132.000.

Woontner, Leo, to RCA Corporation. Cathode ray tube having a luminescent screen including a two component white-emitting phosphoric mixture. 3,891,886, Cl. 313-467.000.

Worden, R. B. Action-shaft fish lure mount. 3,890,736, Cl. 43-42.110.

Worstell, Richard L.: *See—*
Paulson, Peter C.; Henderson, Henri H.; and Worstell, Richard L., 3,891,515.

Worthington Pump International, Inc.: *See—*
Doolin, John H., 3,891,345.

Wray, Glenn Cooper: *See—*
Nelson, Gerald Verdell; and Wray, Glenn Cooper, 3,891,539.

Wright Chemical Corporation: *See—*
Nishio, Kazuo; and Bird, Paul G., 3,891,568.

Wright, Ernest Walter: *See—*
Hoggan, Donald; Wright, Ernest Walter; and Day, Ian, 3,890,820.

Wunsch, Erich: *See—*
Wunsch, Friedgard, nee Kuhn; and Wunsch, Erich, 3,890,960.

Wunsch, Friedgard, nee Kuhn; and Wunsch, Erich, to Efrudec-Vertriebsgesellschaft mbH fur Industrieprodukte aus Metall und Kunststoff. Medical diagnostic inspection spatula. 3,890,960, Cl. 128-16.000.

Wurster, Ewald, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Halogen incandescent lamp. 3,891,885, Cl. 313-178.000.

Wyse, Harold G., to Gad-Jets, Inc. Electrical heating device for use with aerosol containers. 3,891,827, Cl. 219-302.000.

Xerox Corporation: *See—*
Bar-On, Ari, 3,891,206.
Lee, Lieng Huang, 3,891,435.
Walkup, Lewis E., 3,890,929.
Watson, Donald W., 3,891,492.
Wells, John B., 3,891,990.
Whited, Charles A., 3,891,316.

Yabu, Tadahiko: *See—*
Takahara, Ichiro; Yabu, Tadahiko; and Fujita, Jihei, 3,891,796.

Yaeda, Yasuyuki; Chikatsu, Yoshishige; Ando, Noriaki; and Sakata, Ryuichi, to Japan Synthetic Rubber Co., Limited. Ethylene-propylene terpolymer and crystalline 1,2 polybutadiene. 3,891,724, Cl. 260-889.000.

Yagi, Shizuo: *See—*
Date, Tasuku; and Yagi, Shizuo, 3,890,942.

Yajima, Tatsuo: *See—*
Kimura, Yoshiaki; Kawai, Masanori; Yajima, Tatsuo; and Morishita, Taneji, 3,891,320.

Yakushiji, Kunito: *See—*
Wakae, Osamu; Yakushiji, Kunito; and Okada, Yoshiyuki, 3,891,762.

Yamada, Keiko; Kamino, Kimiyuki; and Kubota, Toshiro, to Mitsubishi Seiko Kabushiki Kaishi; and Kyoei Denshi Kogyo Kabushiki Kaisha. Rotor for a hysteresis motor. 3,891,879, Cl. 310-163.000.

Yamada, Yoshitaka: *See—*
Abe, Toshizo; Sakamoto, Seiho; Go, Shigeo; Maekuma, Koichi; Yamada, Yoshitaka; and Hirashima, Yasumasa, 3,891,611.

Yamamoto, Hisao: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 3,891,638.
Okamoto, Tadashi; Kobayashi, Tsuyoshi; and Yamamoto, Hisao, 3,891,626.

Yamamoto, Michihiro: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 3,891,638.

Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, to Sumitomo Chemical Co., Ltd. Process for electrolytic coloring of aluminum cr aluminum alloy articles. 3,891,517, Cl. 204-35.00N.

Yanagisawa, Yuzuru; and Tamura, Hidemasa, to Sony Corporation. Piezoelectric resonator with multi layer electrodes. 3,891,873, Cl. 310-9.700.

Yanai, Tautomu: *See—*
Takenouchi, Senji; Yanai, Tautomu; Matsumoto, Takamasa; and Ohtani, Hiroyoshi, 3,891,051.

Yanev, Yancho Hristov: *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.

Yannone, Robert A.; and Kiscaden, Roy W., to Westinghouse Electric Corporation. Digital computer control system and method for monitoring and controlling operation of industrial gas turbine apparatus to drive simultaneously an electric power plant generator and provide exhaust gases to an industrial process. 3,891,915, Cl. 322-15.000.

Yasuda, Isao; and Osawa, Akira, to Hitachi, Ltd. Light pen position detector for color display device. 3,891,890, Cl. 315-365.000.

Yasumori, Akiyoshi; Ohta, Katsuichi; Kunikane, Makoto; and Abe, Michiharu, to Ricoh Co., Ltd. Electrical coloration recording sheet. 3,891,513, Cl. 204-2.000.

Yatsenko, Sergei Vasilievich: *See—*
Kononenko, Vadim Grigorievich; Strizhenko, Vitaly Evgenievich; Maznichenko, Stanislav Anisimovich; Sarancha, Vladimir Nikolaevich; Stelmakh, Viktor Alexeevich; Komnatny, Igor Pavlovich; Schekochikhin, Serafim Vasilievich; Bozhko, Viktor Vasilievich; Ponomarenko, Nikolai Borisovich; Danilenko, Valeria Mikhailovna; and Yatsenko, Sergei Vasilievich, 3,891,380.

Yeakey, Ernest Leon; and Moss, Philip Hotchkiss, to Jefferson Chemical Company, Inc. Method of purifying gases containing acid impurities using stabilized 2-(2-aminoethoxy)ethanol.. 3,891,742, Cl. 423-229.000.

Yokozawa, Norio: *See—*
Fujimoto, Ryoichi; Takasugi, Kazuo; Inose, Fumiyuki; Maio, Kenji; and Yokozawa, Norio, 3,890,798.

Yoon, Kue H.; Friedrich, Robert E.; and Sletten, Andreas M., to Westinghouse Electric Corporation. EHV circuit breaker utilizing gallium cathode ignitrons for synchronous closing. 3,891,813, Cl. 200-144.0AP.

Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, to Kombinat Za Zvetni Metali "Dimiter Blagoev". Method for treating non-ferrous metal slag. 3,891,428, Cl. 75-24.000.

Yorgin, Nick; and Maier, Alfred E., to Westinghouse Electric Corporation. Clip connected terminal lug. 3,891,298, Cl. 339-272.00R.

Yoshiaki, Mizuki: *See—*
Hideo, Hirokawa; and Yoshiaki, Mizuki, 3,891,310.

Yoshida, Hiroshi: *See—*
Oishi, Kazuo; Ando, Noriyoshi; and Yoshida, Hiroshi, 3,890,938.

Yoshida, Katsuhiko: *See—*
Iijima, Katsuhiko; and Yoshida, Katsuhiko, 3,891,065.

Yoshida, Kiyota; and Ejima, Mizuo, to Rikagaku Kenkyusho. Relief-patterned metal article and a method of making same. 3,891,472, Cl. 148-11.50R.

Yoshino, Tsutomu, to Toyo Kogyo Co., Ltd. Inner surface honing device with workpiece transfer means. 3,891,406, Cl. 51-105.00R.

Yother, Floyd G.: *See—*
Rhinehart, Vance E.; and Yother, Floyd G., 3,891,228.

Youdin, Myron; Barker, June N.; and Reich, Theobald, to New York University. Method for determining discrete localized blood flow in a large volume of tissue. 3,890,959, Cl. 128-2.05F.

Young, Archie R., II: *See—*
Ehrlick, Robert; and Young, Archie R., II, 3,891,686.

Young, Claude A. Hand tool for opening cans. 3,890,912, Cl. 113-1.00K.

Young, Donald C.: *See—*
Block, Michael J.; and Young, Donald C., 3,891,743.

Yui, Masayuki: *See—*
Okazaki, Hiroyuki; Yuji, Isao; and Yui, Masayuki, 3,891,451.

Yuichi Kanaoka: *See—*
Kanaoka, Yuichi; and Machida, Minoru, 3,891,669.

Yuji, Isao: *See—*
Okazaki, Hiroyuki; Yuji, Isao; and Yui, Masayuki, 3,891,451.

Zapadinsky, Boris Isaakovich: *See—*
Berlin, Alfred Anisimovich; Liogonky, Boris Izrailevich; and Zapadinsky, Boris Isaakovich, 3,891,633.

Zeller, Josef: *See—*
Bollig, Georg; Grothe, Horst; Knell, Bernhard; Thalmann, Armin; and Zeller, Josef, 3,891,025.

Zellweger, Jurg: *See—*
Hurlemann, Ernst; and Zellweger, Jurg, 3,890,881.

Zemlin, John C., to USM Corporation. Process for forming a flexible polyurethane coating. 3,891,785, Cl. 427-359.000.

Zenith Radio Corporation: *See—*
Korpel, Adrianus; and Whitman, Robert L., 3,890,829.
Lerner, Martin L., 3,891,491.

Zeunert, Fritz: *See—*
Gerretz, Josef; and Zeunert, Fritz, 3,890,821.

Zhekov, Velyo Dimitroy: *See—*
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitroy; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussey, Yordan Todev, 3,891,428.

Zimmer, George A; Allaben, Charles M., Jr.; and Weidman, William K., to Borg-Warner Corporation. Roller bearing assembly. 3,891,286, Cl. 308-207.000.

Zimmer, Peter. Textile-printing machine. 3,890,896, Cl. 101-119.000.

Zoecon Corporation: *See—*
Baum, John W., 3,891,714.

Zolotov, Shaul: *See—*
Becker, Alan M.; Epstein, Joseph A.; Lupin, Michael S.; and Zolotov, Shaul, 3,891,544.

Zullig, Heinz; and Leutwyler, Robert, to Madag Maschinen- und Apparatebau Dietikon AG. Device on a flat knitting machine for inserting a design. 3,890,808, Cl. 66-127.000.

Zwernemann, Ross, to Motorola, Inc. Method of making a high current Schottky barrier device. 3,891,479, Cl. 148-175.000.

Zysset, Edgar H.: *See—*
Dragomier, John D.; and Zysset, Edgar H., 3,891,117.

LIST OF PLANT PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JUNE, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Armstrong David L., to Armstrong Nurseries, Inc. Nectarine tree. 3,733, 6–24–75, Cl. 40.
Armstrong Nurseries, Inc.: *See*—
Armstrong, David L. 3,733.
Ecke, Paul, Jr., to Paul Ecke Ranch. Poinsettia plant. 3,735, 6–24–75, Cl. 86.
Ecke, Paul, Ranch: *See*—
Ecke, Paul, Jr. 3,735.
Kendall, Harold E. Avocado tree. 3,734, 6–24–75. Cl. 44.

LIST OF DESIGN PATENTEES

AMP Inc.: *See*—
Derr, Paul B., Ferdon, and Harwood. 235,551.
Derr, Paul B., Ferdon, and Harwood. 235,552.
Kunkle, James R. 235,553.
Ahola, Jacob W., B. E. Erlacher, R. E. Guhl, S. L. Kershaw, and A. W. Sieving, to Caterpillar Tractor Co. Dump truck. 235,528, 6–24–75, Cl. D12—15.
Alexander, Merton J. Thumb-oriented food tray. 235,500, 6–24–75, Cl. D7—38.
American Classic Industries: *See*—
Jenkins, Floyd P. 235,540.
American Optical Corp.: *See*—
Loughner, Larry G. 235,577.
American Safety Equipment Corp.: *See*—
Armstrong, Daniel A., and Bartholomew. 235,492.
Amoroso, Nicholas A., to Bright Star Industries, Inc. Bicycle reflector. 235,526, 6–24–75, Cl. D10—111.
Armstrong, Daniel A., and T. B. Bartholomew, to American Safety Equipment Corp. Child safety seat for use in vehicles. 235,492, 6–24–75, Cl. D6—7.
Asam, Jakob, to Informa S.r.l. Electrical lighting apparatus for displaying advertising messages on a rotary drum. 235,588, 6–24–75, Cl. D96—12.
Asberg, Sture L., to SKF Nova AB. Wheel cover. 235,539, 6–24–75, Cl. D12—206.
Atlantic Richfield Co.: *See*—
Dransfield, Clifford D. 235,527.
Baker, Allister L.: *See*—
Kool, J. Peter E., and Baker. 235,524.
Kool, J. Peter E. and Baker. 235,525.
Bartholomew, Thomas B.: *See*—
Armstrong, Daniel A., and Bartholomew. 235,492.
Barton, Stanley E., to Rosenhain and Lipmann Pty. Ltd. Toy construction piece. 235,570, 6–24–75, Cl. D34—15.
Beck, Raymond M., to Mechanical Refrigeration Enterprises. Case for refrigeration test instruments or the like. 235,582, 6–24–75, Cl. D87—1.
Berger, Robert P. Dental blade probe tool. 235,550, 6–24–75, Cl. D24—1.
Bernard, Rodolphe J. Child's boat shaped like a sternwheeler. 235,531, 6–24–75, Cl. D12—68.
Bernard, Rodolphe J. Child's boat shaped like a submarine. 235,532, 6–24–75, Cl. D12—68.
Bernard, Rodolphe J. Child's boat shaped like a log raft. 235,533, 6–24–75, Cl. D12—68.
Bingley, Linda L. Headboard for a bed or similar article. 235,493, 6–24–75, Cl. D6—80.
Bippus, Jacob R., R. Kazusky, Jr., and E. D. Levy, to Rockwell International Corp. Garden sprayer. 235,544, 6–24–75, Cl. D23—18.
Blocker, William C. Filter. 235,542, 6–24–75, Cl. D23—4.
Boston, Andrew W., Jr., and L. M. Porter. Detachable sunroof for a passenger vehicle. 235,536, 6–24–75, Cl. D12—156.
Boutz, Robert W.: *See*—
Greer, Glen A., and Boutz. 235,513.
Boy, Jean, to Compagnie Francaise des Parfums d'Orsay, Societe Anonyme. Bottle. 235,511, 6–24–75, Cl. D9—149.
Bright Star Industries, Inc.: *See*—
Amoroso, Nicholas A. 235,526.
Brindley, Robert E., to Union Carbide Corp. Portable flashlight. 235,575, 6–24–75, Cl. D48—24.
Brix, Hermann, to Girling Ltd. Pad anti-rattle spring for a disc brake. 235,538, 6–24–75, Cl. D12—180.
Brych, Alfred, to Saft-Societe des Accumulateurs Fixes et de Traction. Lamp. 235,573, 6–24–75, Cl. D48—24.
Caterpillar Tractor Co.: *See*—
Ahola, Jacob W., Erlacher, Guhl, Kershaw, and Sieving. 235,528.
Compagnie Francaise des Parfums d'Orsay, Societe Anonyme: *See*—
Boy, Jean. 235,511.
Continental Specialties Corp.: *See*—
Portugal, Ronald J. 235,554.
Cook, Ray, Golf Putters, Inc.: *See*—
Cook, Raymon W. 235,564.
Cook, Raymon W. 235,566.
Cook, Raymon W. 235,567.
Cook, Raymon W. 235,568.
Cook, Raymon W., to Ray Cook Golf Putters, Inc. Golf putter head. 235,564, 6–24–75. Cl. D34—5.
Cook, Raymon W., to Ray Cook Golf Putters, Inc. Golf putter head. 235,566, 6–24–75, Cl. D34—5.
Cook, Raymon W., to Ray Cook Golf Putters, Inc. Golf putter head. 235,567, 6–24–75, Cl. D34—5.
Cook, Raymon W., to Ray Cook Golf Putters, Inc. Golf putter head. 235,568, 6–24–75, Cl. D34—5.
Cox, Quentin T. Float valve. 235,545, 6–24–75, Cl. D23—19.
Cunningham, Harold. Combined measuring and calculating scale. 235,522, 6–24–75, Cl. D10—71.
Cyren, Gunnar, to Dansk International Designs Ltd. Baking dish. 235,497, 6–24–75, Cl. D7—21.
Dansk International Designs Ltd.: *See*—
Cyren, Gunnar. 235,497.
Dart Industries Inc.: *See*—
Laylon, Harry 235,495.
Day, William H., to W. R. Grace & Co. Compartmented serving tray. 235,498, 6–24–75, Cl. D7—38.
Day, William H., to W. R. Grace & Co. Compartmented servtray. 235,499, 6–24–75, Cl. D7—38.
Defina, Angelo L. Toy bank. 235,569, 6–24–75, Cl. D34—11.
Derr, Paul B., G. D. Ferdon, and R. G. Harwood, to AMP Inc. Electrical connector. 235,551, 6–24–75, Cl. D26—1.
Derr, Paul B., G. D. Ferdon, and R. G. Harwood, to AMP Inc. Electrical connector. 235,552, 6–24–75, Cl. D26—1.
De Tomaso, Alejandro, and T. Tjaarda, to SCM Corp. Typewriter. 235,579, 6–24–75, Cl. D64—11.
Donnelly, Jack M., to Girling Ltd. Template. 235,521, 6–24–75, Cl. D10—64.
Dransfield, Clifford D., to Atlantic Richfield Co. Sled for transporting a seismic energy generator. 235,527, 6–24–75, Cl. D12—1.
Dunlop Ltd.: *See*—
Holmes, Brian H., and Flint. 235,535.
Dynamit Nobel Aktiengesellschaft: *See*—
Eusemann, Stephen. 235,541.
Egleston, Harry B., to Ex-Cell-O Corp. Dispensing container or similar article. 235,515, 6–24–75, Cl. D9—240.
Erlacher, Bernard E.: *See*—
Ahola, Jacob W., Erlacher, Guhl, Kershaw, and Sieving. 235,528.
Eusemann, Stephen, to Dynamit Nobel Aktiengesellschaft. Tile. 235,541, 6–24–75, Cl. D18—2.
Ex-Cell-O Corp.: *See*—
Egleston, Harry B. 235,515.
Ferdon, Gilbert D.: *See*—
Derr, Paul B., Ferdon, and Harwood. 235,551.
Derr, Paul B., Ferdon, and Harwood. 235,552.
Fink, Morris, to Windsor Industries, Inc. Combined radio and food service dish. 235,576, 6–24–75, Cl. D56—4.
Flint, Clive: *See*—
Holmes, Brian H., and Flint. 235,535.
France Bed Co., Ltd.: *See*—
Noda, Akihiko, and Tada. 235,496.
Fry, Raymond M. Fireplace equipment caddy. 235,503, 6–24–75, Cl. D7—206.
Funderburk, Ervin M. Dental tongue retractor. 235,549, 6–24–75, Cl. D24—1.
Gage, Charles W. Sunbathing platform. 235,581, 6–24–75, Cl. D83—1.
Gillette Co., The: *See*—
Poisson, Norman D. 235,586.
Girling Ltd.: *See*—
Brix, Hermann. 235,538.
Donnelly, Jack M. 235,521.
Globol-Werke GmbH: *See*—
Schimanski, Georg. 235,547.
Grace, W. R., & Co.: *See*—
Day, William H. 235,498.
Day, William H. 235,499.
Greer, Glen A., and R. W. Boutz. Jewelry box. 235,513, 6–24–75, Cl. D9—223.
Guetzlaff, Karl E. Cross pendant or the like. 235,572, 6–24–75, Cl. D45—16.
Guhl, Richard E.: *See*—
Ahola, Jacob W., Erlacher, Guhl, Kershaw, and Sieving. 235,528.

Hackenberg, Robert A. Carton. 235,514, 6–24–75, Cl. D9—224.
Hall, Edward M. Key holder. 235,584, 6–24–75, Cl. D87—8.
Harwood, Robert G.: *See*—
Derr, Paul B., Ferdon, and Harwood. 235,551.
Derr, Paul B., Ferdon, and Harwood. 235,552.
Haynes, Thomas E. Auxiliary housing for use with pickup trucks. 235,537, 6–24–75, Cl. D12—156.
Hohm, Robert P.: *See*—
Willis, Donald E., and Hohm. 235,574.
Holmes, Brian H., and C. Flint, to Dunlop Ltd. Tire for a vehicle wheel. 235,535, 6–24–75, Cl. D12—142.
Holt, Jorgen, to Nordisk Ventilator Co. Aktieselskab. Injection nozzle rim for ventilating apparatus. 235,548, 6–24–75, Cl. D23—163.
Hospital Systems, Inc.: *See*—
Miller, Robert D. 235,580.
Informa S.r.l.: *See*—
Asam, Jakob. 235,588.
Jaros, Gertrude K. M. Toy house. 235,571, 6–24–75, Cl. D34—15.11.
Jenkins, Floyd P., to American Classic Industries. Building or the like. 235,540, 6–24–75, Cl. D13—1.
Kabushiki Kaisha Koparu: *See*—
Nagata, Hideaki. 235,516.
Nagata, Hideaki. 235,519.
Watanabe, Riki. 235,517.
Watanabe, Riki. 235,518.
Kazusky, R., Jr.: *See*—
Bippus, Jacob R., Kazusky, Jr., and Levy. 235,544.
Kershaw, Samuel L.: *See*—
Ahola, Jacob W., Erlacher, Guhl, Kershaw, and Sieving. 235,528.
Kettler of America, Inc.: *See*—
Von Juergensonn, Siegfried. 235,494.
Keuffel & Esser Co.: *See*—
Kool, J. Peter E., and Baker. 235,524.
Kool, J. Peter E. and Baker. 235,525.
Knukel, Andrew: *See*—
Miller, Murray, and Knukel. 235,523.
Kool, J. Peter E., and A. L. Baker, to Keuffel & Esser Co. Level transit or the like. 235,524, 6–24–75, Cl. D10—66.
Kool, J. Peter E., and A. L. Baker, to Keuffel & Esser Co. Automatic level transit or the like. 235,525, 6–24–75, Cl. D10—66.
Kramer, Marshall J. Earth plug remover. 235,504, 6–24–75, Cl. D8—7.
Kunkle, James R. to AMP Inc. Connector package. 235,553, 6–24–75, Cl. D26—1.
Kwon, Young D. Digital calendar watch. 235,520, 6–24–75, Cl. D10—39.
Landell, Harper, to Speakman Co. Faucet fixture body. 235,546, 6–24–75, Cl. D23—32.
Laylon, Harry, to Dart Industries Inc. Sectional sofa. 235,495, 6–24–75, Cl. D6—63.
Levy, Edward D.: *See*—
Bippus, Jacob R., Kazusky, Jr., and Levy. 235,544.
Lewis, James D. Combined belt and detachable compartments. 235,490, 6–24–75, Cl. D2—381.
Lindsey, James P.: *See*—
Werling, Richard, and Lindsey. 235,543.
Livingston, David T., to Reinell Boats, Inc. Boat. 235,530, 6–24–75, Cl. D12—62.
Loughner, Larry G., to American Optical Corp. Pair of spectacles. 235,577, 6–24–75, Cl. D57—1.
Mantelet, Jean, to Moulinex, Societe Anonyme. Domestic food grater. 235,501, 6–24–75, Cl. D7—47.
Mantelet, Jean, to Moulinex, Societe Anonyme. Domestic food chopper. 235,502, 6–24–75, Cl. D7—155.
Marchetti, Rodney D. Bottle carrying case. 235,512, 6–24–75, Cl. D9—179.
Matthews, James J., to Utility Tool Corp. Cable coring tool. 235,506, 6–24–75, Cl. D8—98.
May, John, Mobile home. 235,534, 6–24–75, Cl. D12—103.
Mechanical Refrigeration Enterprises: *See*—
Beek, Raymond M. 235,582.
Mid-America Body & Equipment Co., Inc.: *See*—
Parry, Alan C. 235,583.
Miller, Murray, and A. Knukel. Combined clock and cabinet. 235,523, 6–24–75, Cl. D10—2.
Miller, Robert D., to Hospital Systems, Inc. Portable hospital emergency life support system. 235,580, 6–24–75, Cl. D83—1.
Minolta Camera Kabushiki Kaisha: *See*—
Miyake, Kenichi, and Nakanishi. 235 578.
Miyake, Kenichi, and M. Nakanishi, to Minolta Camera Kabushiki Kaisha. Lens cap and similar article. 235,578, 6–24–75, Cl. D61—1.
Morse Electro Products Corp.: *See*—
Robson, Arthur. 235,562.
Robson, Arthur. 235,563.
Moulinex, Societe Anonyme: *See*—
Mantelet, Jean. 235,501.
Mantelet, Jean. 235,502.
Muse, Jefferson D. Signboard. 235,587, 6–24–75, Cl. D96—12.
Myers Electric Products, Inc.: *See*—
Plummer, Merle A. 235,555.
Nagata, Hideaki, to Kabushiki Kaisha Koparu. Digital alarm clock. 235,516, 6–24–75, Cl. D10—15.
Nagata, Hideaki, to Kabushiki Kaisha Koparu. Digital alarm clock. 235,519, 6–24–75, Cl. D10—15.
Nakanishi, Masakazu: *See*—
Miyake, Kenichi, and Nakanishi. 235,578.
Nasta Industries, Inc.: *See*—
Speigel, Norman. 235,491.
Noda, Akihiko, and S. Tada, to France Bed Co., Ltd. Chair. 235,496, 6–24–75, Cl. D6—70.
Nordisk Ventilator Co. Aktieselskab: *See*—
Holt, Jorgen. 235,548.
Omniflight Helicopters, Inc.: *See*—
Werling, Richard, and Lindsey. 235,543.
Parry, Alan C., to Mid-America Body & Equipment Co., Inc. Combined vehicle auxiliary fuel tank and utility compartment. 235,583, 6–24–75, Cl. D87—1.
Phelps, Albert C. Bar for turning over a shut-down machine. 235,505, 6–24–75, Cl. D8—88.
Pilato Blat, H. Bottle. 235,510, 6–24–75. Cl. D9—130.
Plummer, Merle A., to Myers Electric Products, Inc. Power outlet/pedestal box. 235,555, 6–24–75, Cl. D26—5.
Poisson, Norman D., to The Gillette Co. Razor. 235,586, 6–24–75, Cl. D95—3.
Porter, Lance M.: *See*—
Boston, Andrew W., Jr., and Porter. 235,536.
Portugal, Ronald J., to Continental Specialties Corp. Electrical sockets and socket boards. 235,554, 6–24–75, Cl. D26—1.
Prisco, Anthony J., Sr. Putting aid attachment for a golf club shaft. 235,565, 6–24–75, Cl. D34—5.
Reinell Boats, Inc.: *See*—
Livingston, David T. 235,530.
Respiratory Care, Inc.: *See*—
Van Amerongen, Edward. 235,509.
Robson, Arthur, to Morse Electro Products Corp. Horn speaker. 235,562, 6–24–75, Cl. D26—14.
Robson, Arthur, to Morse Electro Products Corp. Horn speaker. 235,563, 6–24–75, Cl. D26—14.
Rockwell International Corp.: *See*—
Bippus, Jacob R., Kazusky, Jr., and Levy. 235,544.
Rosenhain and Lipmann Pty. Ltd.: *See*—
Barton, Stanley E. 235,570.
SCM Corp.: *See*—
De Tomaso, Alejandro, and Tjaarda. 235,579.
SKF Nova AB: *See*—
Asberg, Sture L. 235,539.
Saft-Societe des Accumulateurs Fixes et de Traction: *See*—
Brych, Alfred. 235,573.
Salsgiver, John P. Cart for oxygen cylinders. 235,529, 6–24–75, Cl. D12—29.
Schimanski, Georg, to Globol-Werk GmbH. Air purifier. 235,547, 6–24–75, Cl. D23—149.
Shlesinger, Bernard E. Jr., Reed for reed switch. 235,556, 6–24–75, Cl. D26—13.
Shlesinger, Bernard E. Jr., Reed for reed switch. 235,557, 6–24–75, Cl. D26—13.
Shlesinger, Bernard E. Jr., Reed for reed switch. 235,558, 6–24–75, Cl. D26—13.
Shlesinger, Bernard E. Jr., Reed for reed switch. 235,559, 6–24–75, Cl. D26—13.
Shlesinger, Bernard E. Jr., Reed for reed switch. 235,560, 6–24–75, Cl. D26—13.
Shlesinger, Bernard E. Jr., Reed for reed switch. 235,561, 6–24–75, Cl. D26—13.
Sieving, Alfred W.: *See*—
Erlacher, Bernard E., Ahola, Cuhl, Kershaw, and Sieving. 235,528.
Speakman Co.: *See*—
Landell, Harper. 235,546.
Speigel, Norman, to Nasta Industries, Inc. Electric toothbrush. 235,491, 6–24–75, Cl. D4—15.
Spitz, Louis. Reflective safety vest. 235,489, 6–24–75, Cl. D2—27.
Stevens, Dale W. Cot-tent. 235,585, 6–24–75, Cl. D88—3.
Straka, Dean R. Snap-on wall plate for electrical switches. 235,507, 6–24–75, Cl. D8—181.
Tada, Satoshi: *See*—
Noda, Akihiko, and Tada. 235,496.
Tjaarda, Thom: *See*—
De Tomaso, Alejandro, and Tjaarda. 235,579.
Union Carbide Corp.: *See*—
Brindley, Robert E. 235,575.
Utility Tool Corp.: *See*—
Matthews, James J. 235,506.
Van Amerongen, Edward, to Respiratory Care, Inc. Bottle. 235,509, 6–24–75, Cl. D9—83.
Von Juergensonn, Siegfried, to Kettler of America, Inc. Adjustable beach chair. 235,494, 6–24–75, Cl. D6—38.
Watanabe, Riki, to Kabushiki Kaisha Koparu. Digital clock. 235,517, 6–24–75, Cl. D10—15.
Watanabe, Riki, to Kabushiki Kaisha Koparu. Digital clock. 235,517, 6–24–75, Cl. D10—15.
Werling, Richard, and J. P. Lindsey, to Omniflight Helicopters, Inc. Spray unit. 235,543, 6–24–75, Cl. D23—18.
Willis, Donald E., and R. P. Hohm; said Hohm assignor to said Willis. Head supported flashlight. 235,574, 6–24–75, Cl. D48—24.
Windsor Industries, Inc.: *See*—
Fink, Morris. 235,576.
Yamasaki, Tetsumi. Valve bracket. 235,508, 6–24–75, Cl. D8—233.

CLASSIFICATION OF PATENTS

ISSUED JUNE 24, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8 3,890,646
9 3,890,647
20 3,890,648
161A 3,890,649

CLASS 3

7 3,890,650

CLASS 4

26 3,890,651
58 3,890,652
131 3,890,653
3,890,654
178 3,890,655
3,890,656
223 3,890,657

CLASS 5

2B 3,890,658
82 3,890,659
101 3,890,660

CLASS 8

10.1 3,891,385
18 3,891,386
3,891,387
39 3,891,388
149.2 3,891,389
173 3,891,390

CLASS 9

310B 3,890,661
313 3,890,662

CLASS 10

27R 3,890,663

CLASS 12

146B 3,890,664

CLASS 15

104.06R 3,890,665
142 3,890,666
250.042 3,890,667

CLASS 16

35 3,890,668
3,890,669
129 3,890,670
137 3,890,671
141 3,890,672

CLASS 17

1A 3,890,673
11 3,890,674
41 3,890,675
45 3,890,676

CLASS 19

255 3,890,677

CLASS 23

230R 3,891,392
271R 3,891,393
273R 3,891,394
273 3,891,395
288F 3,891,396
300 3,891,397

CLASS 24

49C 3,890,678
213 3,890,679
214 3,890,680

CLASS 28

4R 3,890,681

CLASS 29

1.3 3,890,682
132 3,890,683
156.4R 3,890,684
156.8H 3,890,685
173 3,890,687
182.2 3,891,398
182.5 3,891,399
196.1 3,890,686
197.5 3,891,400
200R 3,890,688
203C 3,890,689
404 3,890,690
423 3,890,691
427 3,890,692
429 3,890,693
450 3,890,694
458 3,890,695
526 3,890,697
577 3,890,698
590 3,890,699
599 3,890,700
611 3,890,702
621 3,890,703

CLASS 30

43.6 3,890,705
3,890,709
47 3,890,704
180 3,890,706
340 3,890,707
393 3,890,708

CLASS 32

11 3,890,710
17 3,890,711
33 3,890,712
60 3,890,713
64 3,890,714

CLASS 33

1B 3,890,715
1D 3,890,716
86 3,890,717
301 3,890,718

CLASS 34

55 3,890,719
3,890,720
73 3,890,721

CLASS 35

12P 3,890,722
17 3,890,723
48R 3,890,724

CLASS 36

11.5 3,890,725

CLASS 37

124 3,890,726

CLASS 40

68.6 3,890,727
140 3,890,728

CLASS 42

7 3,890,729
16 3,890,730
25 3,890,731
39.5 3,890,732
89 3,890,733

CLASS 43

4 3,890,734
36 3,890,735
42.11 3,890,736
57.5R 3,890,737

CLASS 44

68 3,891,401

CLASS 46

16 3,890,738

CLASS 47

56 3,890,739
58 3,890,740

CLASS 48

197R 3,891,402
3,891,403
213 3,891,404

CLASS 49

162 3,890,741
350 3,890,742
352 3,890,743
360 3,890,744

CLASS 51

71 3,890,745
105R 3,891,405
3,891,406
287 3,891,407
295 3,891,408
334 3,890,746
361 3,891,409

CLASS 52

64 3,890,747
79 3,890,748
84 3,890,749
127 3,890,750
166 3,890,751
495 3,890,752
500 3,890,753
631 3,890,754
645 3,890,755
648 3,890,756
695 3,890,757
713 3,890,758
753C 3,890,759
758A 3,890,760

CLASS 53

22A 3,890,761
25 3,890,762
39 3,890,763
61 3,890,764
183 3,890,765
234 3,890,766
296 3,890,767

CLASS 54

39 3,890,768

CLASS 55

20 3,891,410
26 3,891,411
67 3,891,412
3,891,413
108 3,891,414
122 3,891,415
178 3,891,416
274 3,891,417
302 3,891,418

CLASS 56

1 3,890,769
3,890,770
9 3,890,771
202 3,890,772
255 3,890,773
330 3,890,774
3,890,775

CLASS 58

23C 3,890,776
50R 3,890,777
57.5 3,890,778
76 3,890,779

CLASS 60

39.08 3,890,780
267 3,890,781
327 3,890,782
420 3,890,783
468 3,890,788
516 3,890,784
525 3,890,785
547 3,890,786
648 3,890,787
659 3,890,789

CLASS 61

3 3,890,790
30 3,890,802
43 3,890,791
45D 3,890,792
3,890,793
54 3,890,794
3,890,795
69 3,890,796

CLASS 62

91 3,890,797
155 3,890,798
215 3,890,799

CLASS 63

13 3,890,800
15.65 3,890,801

CLASS 64

27B 3,890,803

CLASS 65

30 3,891,419
106 3,891,420
107 3,891,421
137 3,891,422

CLASS 66

50R 3,890,804
3,890,805
3,890,806
86R 3,890,807
127 3,890,808
132R 3,890,809
161 3,890,810

CLASS 68

200 3,890,811
224 3,890,812

CLASS 70

92 3,890,813
106 3,890,814
363 3,890,815
86 3,891,423
98 3,891,424

CLASS 72

6 3,890,817
42 3,890,818
57 3,890,819
169 3,890,820
208 3,890,821
273 3,890,822
402 3,890,823
453 3,890,824

CLASS 73

15B 3,890,825
27R 3,890,826
28 3,890,827
29 3,890,828
67.5H 3,890,829
73 3,890,830
88B 3,890,831
116 3,890,832
141A 3,890,833
144 3,890,834
147 3,890,835
168 3,890,836
194B 3,890,838
194E 3,890,837
199 3,890,839
204 3,891,391
290V 3,890,840
359 3,890,841
420 3,890,842
421B 3,890,843
421R 3,890,844
462 3,890,845

CLASS 74

10.2 3,890,849
10.41 3,890,846
217B 3,890,847
372 3,890,850
400 3,890,851
410 3,890,852
435 3,890,853
492 3,890,854
501M 3,890,848
730 3,890,855
869 3,890,856

CLASS 75

.5BA 3,890,816
10R 3,891,426
10V 3,891,425
12 3,891,427
24 3,891,428
60 3,891,429
77 3,891,430
122 3,891,431
130R 3,891,432
147 3,891,433

CLASS 76

25A 3,890,857

CLASS 81

9.5R 3,890,858
52.4R 3,890,859

CLASS 82

38A 3,890,860

CLASS 83

23 3,890,861
71 3,890,862
3,890,863
162 3,890,864
198 3,890,865
346 3,890,866
404 3,890,867
408 3,890,868
559 3,890,869
616 3,890,870

CLASS 84

1.01 3,890,871
207 3,890,872
383 3,890,873
384 3,890,874
471 3,890,875

CLASS 85

62 3,890,876

CLASS 86

1 3,890,877

CLASS 89

1.7 3,890,878
1.75 3,890,880
1.816 3,890,879
176 3,890,881

CLASS 91

487 3,890,882
499 3,890,883

CLASS 92

84 3,890,884
125 3,890,885

CLASS 93

93D 3,890,886

CLASS 96

1LY 3,891,434
1.5 3,891,435
27H 3,891,436
36.1 3,891,440
36.3 3,891,437
49 3,891,438
3,891,439
68 3,891,441
76R 3,891,442
79 3,891,443
84R 3,891,444
100 3,891,445
107 3,891,446

CLASS 98

115K 3,890,887

CLASS 99

483 3,890,888

CLASS 100

48 3,890,889
3,890,890
102 3,890,891

CLASS 101

32 3,890,892
69 3,890,893
93.18 3,890,894
111 3,890,895
119 3,890,896
148 3,890,897
3,890,898
269 3,890,899

CLASS 102

70.2R 3,890,900
3,890,901
93 3,890,902

CLASS 104

1R 3,890,903
121 3,890,904
138G 3,890,905
148SS 3,890,906

CLASS 106

1 3,891,447
15FP 3,891,448
3,891,449
26 3,891,450
30 3,891,451
48 3,891,452
85 3,891,453
89 3,891,454
288Q 3,891,455

CLASS 108

136 3,890,907

CLASS 110

8R 3,890,908

CLASS 111

1 3,890,909
3,890,910

CLASS 112

121.12 3,890,911

CLASS 113

1K 3,890,912

CLASS 114

20R 3,890,913
23 3,890,914
207 3,890,915
219 3,890,916
220 3,890,917
235WS 3,890,918
239 3,890,919

CLASS 115

6.1 3,890,920

CLASS 118

4 3,890,921
7 3,890,922
19 3,890,923
78 3,890,924
104 3,890,925
325 3,890,926
419 3,890,927
637 3,890,928
3,890,929

CLASS 119

1 3,890,930
3,890,931
19 3,890,932
60 3,890,933
78 3,890,934

CLASS 122

4D 3,890,935
248 3,890,936

CLASS 123

8.45 3,890,937
8.47 3,890,939
32EA 3,890,938
32C 3,890,940
44R 3,890,941
75B 3,890,942
90.3 3,890,943
117R 3,890,944
119A 3,890,945
119R 3,890,946
148DS 3,890,947
148E 3,890,948
188M 3,890,949
193P 3,890,950

CLASS 124

41 3,890,951

CLASS 126

45 3,890,952

CLASS 128

1.5 3,890,953
2F 3,890,955
3,890,956
2S 3,890,958
2W 3,890,954
2.05D 3,890,962
2.05F 3,890,959
2.1B 3,890,957
16 3,890,960
17 3,890,961
24.1 3,890,963
62R 3,890,964
66 3,890,965
146.2 3,890,966
202 3,890,967
214E 3,890,968
214R 3,890,969
215 3,890,970
218R 3,890,971
220 3,890,972
286 3,890,973
287 3,890,974
339 3,890,975
351 3,890,976
418 3,890,977
485 3,890,978
555 3,890,979

CLASS 131

121 3,890,980
144 3,890,981
243 3,890,982
267 3,890,983

CLASS 132

9 3,890,984
3,890,985
84A 3,890,986

CLASS 134

3 3,891,456
57D 3,890,987
111 3,890,988

CLASS 135

7.1R 3,890,989
20R 3,890,990

CLASS 136
6LN 3,891,457
3,891,458
26 3,891,459
83T 3,891,460
86E 3,891,461
111 3,891,462
134R 3,891,463
145 3,891,464
182 3,891,465
200 3,891,466
233 3,891,467

CLASS 137
1 3,890,991
14 3,890,992
45 3,890,993
67 3,890,994
113 3,890,995
119 3,890,996
271 3,890,997
436 3,890,998
505.25 3,890,999
525.3 3,891,000
549 3,891,001
557 3,891,002
561A 3,891,003
615 3,891,004
625.4 3,891,005
625.6 3,891,145

CLASS 138
94.3 3,891,146
106 3,891,006
121 3,891,007
146 3,891,008
149 3,891,009

CLASS 139
313 3,891,010
372 3,891,011

CLASS 140
93A 3,891,012
147 3,891,013

CLASS 144
32 3,891,014
136J 3,891,015
209A 3,891,016

CLASS 145
50A 3,891,017

CLASS 148
1.5 3,891,468
3,891,469
6.14 3,891,470
6.16 3,891,471
11.5R 3,891,472
16.5 3,891,474
16.7 3,891,473
31.55 3,891,475
103 3,891,476
125 3,891,477
171 3,891,478
175 3,891,479
187 3,891,480
188 3,891,481

CLASS 149
7 3,891,482

CLASS 152
225 3,891,018

CLASS 156
3 3,891,483
60 3,891,484
63 3,891,485
71 3,891,486
78 3,891,487
170 3,891,488
171 3,891,489
295 3,891,490
345 3,891,491
351 3,891,492
437 3,891,494
455 3,891,493

CLASS 157
1.24 3,891,019

CLASS 159
6WH 3,891,495
47R 3,891,496

CLASS 160
37 3,891,020
235 3,891,021

CLASS 162
6 3,891,497
154 3,891,498
157R 3,891,499
274 3,891,500
290 3,891,501

CLASS 164
41 3,891,022
55 3,891,023
89 3,891,024
154 3,891,025
282 3,891,026

CLASS 165
2 3,891,027
6 3,891,028
8 3,891,029
10 3,891,030

CLASS 166
68.5 3,891,031
117.5 3,891,032
133 3,891,033
285 3,891,034

CLASS 172
197 3,891,035

CLASS 173
91 3,891,036

CLASS 174
68.5 3,891,789
93 3,891,790
107 3,891,791

CLASS 175
6 3,891,037
7 3,891,038
40 3,891,039

CLASS 176
71 3,891,502

CLASS 177
230 3,891,040
255 3,891,041

CLASS 178
5.8R 3,891,792
6 3,891,793
6.6DD 3,891,796
6.7R 3,891,794
6.8 3,891,797
3,891,798
7.2 3,891,795
22 3,891,799
69.5TV 3,891,800

CLASS 179
1CN 3,891,801
2A 3,891,802
15AL 3,891,804
15AN 3,891,806
15BF 3,891,805
15BS 3,891,807
15FS 3,891,803
16EA 3,891,808
119R 3,891,809
156R 3,891,810
175.3A 3,891,811

CLASS 180
6.48 3,891,042
13 3,891,043
31 3,891,044
66R 3,891,045
105E 3,891,046
117 3,891,047
119 3,891,048

CLASS 181
36A 3,891,049
102 3,891,050

CLASS 182
63 3,891,051
88 3,891,052
97 3,891,053
107 3,891,054
141 3,891,055
148 3,891,056

CLASS 184
7D 3,891,057
55A 3,891,058
104B 3,891,059

CLASS 186
1R 3,891,060
14 3,891,061

CLASS 187
10 3,891,062
11 3,891,063
29R 3,891,064

CLASS 188
41 3,891,065
73.2 3,891,066
196BA 3,891,068
196D 3,891,067
250G 3,891,069

CLASS 190
41R 3,891,070

CLASS 192
3TR 3,891,071
99A 3,891,072

CLASS 193
35A 3,891,073

CLASS 194
1R 3,891,074
9R 3,891,075
102 3,891,076

CLASS 195
28R 3,891,503
3,891,504
80R 3,891,505
3,891,506
103.5R 3,891,507
103.5 3,891,508
109 3,891,509

CLASS 197
1R 3,891,077
156 3,891,078

CLASS 198
36 3,891,079
43 3,891,080
218 3,891,081

CLASS 200
61.18 3,891,812
144AP 3,891,813
148R 3,891,814
175 3,891,815

CLASS 202
206 3,891,510

CLASS 203
81 3,891,511

CLASS 204
1T 3,891,512
2 3,891,513
15 3,891,514
16 3,891,542
26 3,891,515
33 3,891,516
35N 3,891,517
35R 3,891,518
37R 3,891,519
55R 3,891,520
105R 3,891,521
108 3,891,522
159.15 3,891,523
3,891,524
181 3,891,525
3,891,526
3,891,527
186 3,891,528
195S 3,891,529
197 3,891,530
260 3,891,532
263 3,891,531
267 3,891,533
272 3,891,534
275 3,891,535
298 3,891,536
308 3,891,537

CLASS 206
8 3,891,082
98 3,891,083
143 3,891,084
229 3,891,085
320 3,891,086
346 3,891,087
349 3,891,088
439 3,891,089
478 3,891,090

CLASS 208
50 3,891,538
59 3,891,539
77 3,891,540
89 3,891,541

CLASS 209
144 3,891,543
166 3,891,544
3,891,545
211 3,891,546

CLASS 210
23 3,891,547
65 3,891,548
66 3,891,549
67 3,891,550
82 3,891,551
88 3,891,552
136 3,891,553
152 3,891,554
169 3,891,555
490 3,891,556
519 3,891,557
526 3,891,558

CLASS 211
13 3,891,092
46 3,891,093
105.3 3,891,091

CLASS 212
20 3,891,094
48 3,891,095

CLASS 214
1BB 3,891,096
8.5H 3,891,097
3,891,098
17DA 3,891,099
38CA 3,891,100
63 3,891,101
75H 3,891,103
75T 3,891,102
132 3,891,104
305 3,891,105
318 3,891,106
392 3,891,107
512 3,891,108
519 3,891,109

CLASS 215
216 3,891,110

CLASS 217
60F 3,891,111

CLASS 219
10.55F 3,891,818
10.55R 3,891,817
69M 3,891,819
76 3,891,820
3,891,821
85 3,891,822
3,891,823
121P 3,891,824
243 3,891,825
273 3,891,826
302 3,891,827
383 3,891,828

CLASS 220
1.5 3,891,112
3.6 3,891,113
209 3,891,114
260 3,891,115
270 3,891,116
3,891,117
288 3,891,118
324 3,891,119

CLASS 221
2 3,891,120

CLASS 222
1 3,891,121
17 3,891,122
64 3,891,123
66 3,891,124
129 3,891,125
334 3,891,126
387 3,891,127
402.17 3,891,128

CLASS 223
37 3,891,129

CLASS 224
5C 3,891,130
25A 3,891,131
42.03B 3,891,132

CLASS 227
10 3,891,133
14 3,891,134

CLASS 228
173 3,890,696

CLASS 229
4.5 3,891,135
22 3,891,136
44R 3,891,137
56 3,891,138

CLASS 232
35 3,891,139

CLASS 233
26 3,891,140

CLASS 234
1 3,891,141

CLASS 235
58P 3,891,142
61.11E 3,891,829
3,891,831
61.7B 3,891,830
61.7R 3,891,143
150.2 3,891,832
3,891,833
151.11 3,891,835
151.12 3,891,836
151.3 3,891,834
152 3,891,837
153AK 3,891,838
153AS 3,891,839
183 3,891,840

CLASS 236
46 3,891,144

CLASS 239
6 3,891,147
68 3,891,148
70 3,891,149
272 3,891,150
533 3,891,151

CLASS 240
1LP 3,891,841
1.4 3,891,842

CLASS 241
88.4 3,891,152
214 3,891,153

CLASS 242
43 3,891,154
45 3,891,155
54R 3,891,156
56.2 3,891,157
58.1 3,891,158
199 3,891,159

CLASS 244
1SS 3,891,160
3.12 3,891,161
3.22 3,891,166
3.25 3,891,162
42CD 3,891,163
134A 3,891,164
137R 3,891,165

CLASS 246
34R 3,891,167
167R 3,891,168

CLASS 248
5 3,891,169
119 3,891,170
131 3,891,171
223 3,891,172
226A 3,891,173
313 3,891,174
317 3,891,175
340 3,891,176
352 3,891,177

CLASS 249
91 3,891,178
134 3,891,179

CLASS 250
199 3,891,559
203R 3,891,843
303 3,891,844
321 3,891,845
324 3,891,846
342 3,891,847
345 3,891,848
372 3,891,849
385 3,891,851
391 3,891,852
444 3,891,850
458 3,891,853
461 3,891,560
468 3,891,854
492 3,891,855
523 3,891,856
541 3,891,561
547 3,891,562
551 3,891,858
560 3,891,857
564 3,891,859

CLASS 251
120 3,891,180
128 3,891,181
297 3,891,182
315 3,891,183

CLASS 252
8.55D 3,891,567
8.55R 3,891,565
3,891,566
8.8 3,891,563
40 3,891,564
181 3,891,568
301.2R 3,891,569
316 3,891,570
3,891,572
354 3,891,571
408 3,891,573
421 3,891,574
455R 3,891,575

CLASS 254
4R 3,891,184
10.5 3,891,185
29R 3,891,186
93R 3,891,187
134.3R 3,891,188

CLASS 256
1 3,891,189

CLASS 259
1R 3,891,191
110 3,891,192
165 3,891,193

CLASS 260
2.1R 3,891,576
2.5AC 3,891,578
2.5AW 3,891,579
2.5R 3,891,577
8 3,891,580
16 3,891,581
17R 3,891,582
18EP 3,891,583
27R 3,891,584
28.5AS 3,891,585
3,891,586
28.5AV 3,891,587
29.2EP 3,891,589
29.4R 3,891,590
29.6WB 3,891,591
29.7E 3,891,592
29.7R 3,891,588
34.2 3,891,593
37N 3,891,594
38 3,891,595
40R 3,891,596
42.21 3,891,597
42.56 3,891,598
45.7R 3,891,599
45.75R 3,891,600
47CP 3,891,601
47EN 3,891,602
63R 3,891,603
75H 3,891,605
75R 3,891,604
77.5AM 3,891,606
80.3N 3,891,607
80.78 3,891,608
85.5HC 3,891,609
88.2B 3,891,611
88.2R 3,891,610
99.5 3,891,612
112G 3,891,613
112.5 3,891,614
3,891,615
3,891,616
148 3,891,617
163 3,891,618
165 3,891,619
209.6 3,891,620
210R 3,891,621
211R 3,891,622
211.5R 3,891,623
233.3R 3,891,624
239BB 3,891,626
239A 3,891,625
239.1 3,891,627
3,891,628
3,891,629
239.3B 3,891,630
239.55R 3,891,631
240D 3,891,632
240G 3,891,633
243A 3,891,636
243C 3,891,635
243R 3,891,637
244R 3,891,638
247.1H 3,891,639
247.5FP 3,891,640
250AP 3,891,642
250A 3,891,641
250Q 3,891,643
251A 3,891,644
256.5R 3,891,645
268BC 3,891,648
268DK 3,891,646
3,891,649
268TR 3,891,647
287R 3,891,651
288CF 3,891,653
288R 3,891,652
289C 3,891,654
289R 3,891,655
290R 3,891,656
293.54 3,891,657
3,891,658
294.8F 3,891,659
295.5B 3,891,660
297R 3,891,661
306.7R 3,891,662
307D 3,891,664
307F 3,891,663
3,891,665
308B 3,891,666
308R 3,891,667
309 3,891,668
326.3H 3,891,669
326.47 3,891,671
326.5FM 3,891,670
327S 3,891,672
327T 3,891,673
340.5 3,891,674
340.9 3,891,675
3,891,676
3,891,677
343.2R 3,891,678
343.9 3,891,679
346.8M 3,891,680
376 3,891,650
397.1 3,891,681
401 3,891,682
410.6 3,891,683
429R 3,891,684
438.1 3,891,685
448R 3,891,686
453R 3,891,687
455A 3,891,688
458 3,891,689
465D 3,891,691
468G 3,891,697
471C 3,891,692
471R 3,891,693
475B 3,891,694
475N 3,891,695
479R 3,891,696
501.14 3,891,698
515R 3,891,699
525 3,891,700
545R 3,891,701
553R 3,891,702
556N 3,891,703
564E 3,891,704
565 3,891,705
569 3,891,706
583K 3,891,707
583N 3,891,708
584B 3,891,709
593R 3,891,710
597R 3,891,711

599 3,891,712
607A 3,891,713
609F 3,891,714
615B 3,891,715
618R 3,891,716
623R 3,891,717
859R 3,891,718
873 3,891,719
878R 3,891,720
879 3,891,721
3,891,722
884 3,891,723
889 3,891,724
3,891,725
3,891,816
927R 3,891,726
928 3,891,727
955 3,891,728

CLASS 261

87 3,891,729

CLASS 264

11 3,891,730
33 3,891,731
34 3,891,732
40 3,891,733
43 3,891,734
59 3,891,735
92 3,891,736
95 3,891,737
101 3,891,738
155 3,891,739
263 3,891,740

CLASS 266

4A 3,891,194
23P 3,891,195
34T 3,891,196

CLASS 267

47 3,891,197
110 3,891,198
139 3,891,199
140 3,891,200

CLASS 269

136 3,891,201

CLASS 270

58 3,891,202

CLASS 271

4 3,891,203
85 3,891,204
98 3,891,205
174 3,891,206

CLASS 272

58 3,891,207
65 3,891,208

CLASS 273

1R 3,891,209
30 3,891,210
73L 3,891,211
80.1 3,891,212
95D 3,891,213
102B 3,891,214
106A 3,891,215
119R 3,891,216
130E 3,891,218
130R 3,891,217
136F 3,891,219
150 3,891,220
177R 3,891,221

CLASS 274

1R 3,891,222

CLASS 277

32 3,891,223
207 3,891,224

CLASS 280

11.19 3,891,225
11.35K 3,891,226
11.35R 3,891,227
36R 3,891,228
41B 3,891,229
43.24 3,891,230
47.13R 3,891,245
106.5R 3,891,231
124A 3,891,232
124F 3,891,241
150AB 3,891,233
211 3,891,234
252 3,891,235
283 3,891,236
446R 3,891,238
477 3,891,237
479R 3,891,239

CLASS 281

29 3,891,240

CLASS 283

6 3,891,242
35 3,891,243
56 3,891,244

CLASS 285

110 3,891,246
3,891,247
156 3,891,248
189 3,891,249
242 3,891,250
338 3,891,251

CLASS 290

52 3,891,860

CLASS 292

6 3,891,252
59 3,891,253
113 3,891,254
169.13 3,891,255
202 3,891,256
262 3,891,257

CLASS 293

98 3,891,258

CLASS 294

33 3,891,259
90 3,891,260

CLASS 296

1R 3,891,261
3 3,891,262
24R 3,891,263
28C 3,891,264
78.1 3,891,265
137R 3,891,266

CLASS 297

68 3,891,267
217 3,891,268
252 3,891,269
347 3,891,270
386 3,891,271
3,891,272
388 3,891,273
389 3,891,274

CLASS 299

32 3,891,275

CLASS 301

37R 3,891,276

CLASS 303

2 3,891,277
21AF 3,891,279
21F 3,891,278
22R 3,891,280

CLASS 307

117 3,891,861
125 3,891,862
147 3,891,863
212 3,891,864
232 3,891,865
252A 3,891,866
264 3,891,867

CLASS 308

1R 3,891,281
5R 3,891,283
6C 3,891,284
9 3,891,282
10 3,891,285
207 3,891,286
237A 3,891,287

CLASS 310

5 3,891,868
8.2 3,891,869
8.7 3,891,870
9.1 3,891,871
9.5 3,891,872
9.7 3,891,873
14 3,891,874
40 3,891,875
43 3,891,876
61 3,891,877
90 3,891,878
163 3,891,879
196 3,891,880
218 3,891,881

CLASS 312

338 3,891,288

CLASS 313

7 3,891,882
5 3,891,883
107 3,891,884
178 3,891,885
467 3,891,886

CLASS 315

3 3,891,887
82 3,891,888
365 3,891,890
368 3,891,889
379 3,891,891
411 3,891,892

CLASS 317

11A 3,891,893
18C 3,891,894
18D 3,891,895
58 3,891,896
62 3,891,897
101CC 3,891,898
105 3,891,899
139 3,891,900
258 3,891,901

CLASS 318

139 3,891,902
212 3,891,903
254 3,891,904
3,891,905
257 3,891,906
369 3,891,907
434 3,891,908
469 3,891,909
572 3,891,910
696 3,891,911

CLASS 321

16 3,891,912
45R 3,891,913
47 3,891,914

CLASS 322

15 3,891,915

CLASS 324

6 3,891,916
16R 3,891,917
34D 3,891,918
72 3,891,919
77B 3,891,920
125 3,891,921
151R 3,891,922
154R 3,891,923
158P 3,891,924
169 3,891,925

CLASS 325

159 3,891,926
421 3,891,927
474 3,891,928

CLASS 328

14 3,891,929
117 3,891,930
127 3,891,931
147 3,891,932

CLASS 330

2 3,891,933
21 3,891,934
22 3,891,935
28 3,891,936
29 3,891,937
107 3,891,938

CLASS 331

1A 3,891,939
48 3,891,940
94.5G 3,891,941
3,891,942
3,891,943
3,891,944
94.5P 3,891,945
108D 3,891,946

CLASS 333

17 3,891,947
73W 3,891,948
84R 3,891,949

CLASS 335

151 3,891,950
210 3,891,951
258 3,891,952
289 3,891,953

CLASS 336

61 3,891,954
205 3,891,955

CLASS 337

1 3,891,956
347 3,891,957

CLASS 338

35 3,891,958

CLASS 339

14P 3,891,289
15 3,891,290
3,891,291
36 3,891,292
97C 3,891,293
103R 3,891,294
198GA 3,891,295
246 3,891,296
270R 3,891,297
272R 3,891,298

CLASS 340

3R 3,891,960
5R 3,891,961
15 3,891,962
15.5TS 3,891,963
52F 3,891,965
52R 3,891,964
53 3,891,966
63 3,891,967
146.1AL 3,891,969
146.1AQ 3,891,959
146.3E 3,891,968
162 3,891,970
172.5 3,891,971
3,891,972
3,891,973
3,891,974
173LM 3,891,975
3,891,976
173R 3,891,977
174TF 3,891,978
234 3,891,979
258D 3,891,980
324AD 3,891,982
324M 3,891,981
336 3,891,983
347CC 3,891,984
353 3,891,985
371 3,891,986

CLASS 343

5R 3,891,987
16LS 3,891,988
18E 3,891,989

CLASS 346

74E 3,891,990
3,891,991

CLASS 350

3.5 3,891,300
6 3,891,299
85 3,891,301
96WG 3,891,302
132 3,891,303
144 3,891,305
160LC 3,891,306
3,891,307
160R 3,891,309
161 3,891,308
184 3,891,304
187 3,891,310

CLASS 351

38 3,891,311

CLASS 352

180 3,891,312

CLASS 353

8 3,891,313
101 3,891,314

CLASS 354

152 3,891,992

CLASS 355

8 3,891,315
14 3,891,316
68 3,891,317
100 3,891,318

CLASS 356

5 3,891,319
109 3,891,320
111 3,891,321
126 3,891,322
154 3,891,323
156 3,891,324
205 3,891,325
222 3,891,326
244 3,891,327
249 3,891,328

CLASS 357

19 3,891,993
41 3,891,190

CLASS 358

11 3,891,994

CLASS 360

123 3,891,995

CLASS 401

65 3,891,329
122 3,891,330
132 3,891,331

CLASS 403

13 3,891,332
84 3,891,333
173 3,891,335
192 3,891,339
234 3,891,334
320 3,891,336

CLASS 404

26 3,891,337
38 3,891,340
84 3,891,338
121 3,891,341
128 3,891,342

CLASS 408

42 3,891,343

CLASS 415

1 3,891,344
121R 3,891,345
129 3,891,346

CLASS 416

32 3,891,347
97 3,891,348
132 3,891,349
180 3,891,350
219 3,891,351

CLASS 417

101 3,891,352
183 3,891,353
216 3,891,354
371 3,891,355
437 3,891,356

CLASS 418

61A 3,891,357
63 3,891,358
104 3,891,359
132 3,891,360
142 3,891,361

CLASS 423

2 3,891,741
229 3,891,742
267 3,891,743
415 3,891,744
462 3,891,745
465 3,891,690
492 3,891,746
499 3,891,747
587 3,891,748

CLASS 424

80 3,891,750
87 3,891,751
117 3,891,752
118 3,891,753
3,891,754
157 3,891,755
177 3,891,756
200 3,891,758
219 3,891,759
263 3,891,760
266 3,891,761
270 3,891,762
271 3,891,763
273 3,891,764
274 3,891,765
283 3,891,766
288 3,891,767
309 3,891,768
310 3,891,757
311 3,891,749
322 3,891,769

CLASS 425

4R 3,891,362
28B 3,891,364
28R 3,891,363
78 3,891,367
114 3,891,368
131.1 3,891,365
140 3,891,366
144 3,891,370
174 3,891,369
233 3,891,371
244 3,891,372
301 3,891,373
326R 3,891,374
344 3,891,375
373 3,891,376
383 3,891,377
398 3,891,378
464 3,891,379

CLASS 426

32 3,891,770
52 3,891,771
60 3,891,772
61 3,891,773
104 3,891,774
107 3,891,775
399 3,891,779
429 3,891,781
455 3,891,782
478 3,891,783
573 3,891,776
3,891,777
3,891,778
657 3,891,780

CLASS 427

295 3,891,784
359 3,891,785

CLASS 428

136 3,891,786
409 3,891,787
511 3,891,788

CLASS 431

1 3,891,380
255 3,891,381

CLASS 432

58 3,891,382
80 3,891,383
217 3,891,384

D2—	27	235,489		98	235,506		66	235,524	D13—	1A	235,540			235,557	D48—	24A	235,573
	381	235,490		181	235,507			235,525	D18—	2B	235,541			235,558			235,574
D4—	15	235,491		233	235,508		71	235,522	D23—	1	235,542			235,559			235,575
D6—	7	235,492	D9—	83	235,509		111	235,526		18	235,543			235,560	D56—	4B	235,576
	38	235,494		130	235,510	D12—	1	235,527			235,544			235,561	D57—	1F	235,577
	63	235,495		149	235,511		15	235,528		19	235,545		14G	235,562	D61—	E	235,578
	70	235,496		179	235,512		29	235,529		32	235,546			235,563	D64—	11A	235,579
	80	235,493		223	235,513		62	235,530		149	235,547	D34—	5CB	235,565	D83—	1C	235,581
D7—	21	235,497		224	235,514		68	235,531		163	235,548		GH	235,564		F	235,580
	38	235,498		240	235,515			235,532	D24—	1D	235,549			235,566	D87—	R	235,582
		235,499	D10—	2	235,523			235,533			235,550			235,567			235,583
		235,500		15	235,516		103	235,534	D26—	A	235,551			235,568		8	235,584
	47	235,501			235,517		142	235,535			235,552		11R	235,569	D88—	3B	235,585
	155	235,502			235,518		156	235,536			235,553		15GG	235,570	D95—	A	235,586
	206	235,503			235,519			235,537		B	235,554		LL	235,571	D96—	12R	235,588
D8—	7	235,504		39	235,520		180	235,538		5R	235,555	D45—	16B	235,572			235,587
	88	235,505		64	235,521		206	235,539		13	235,556						

CLASSIFICATION OF PLANTS

P. —	40	3,733	P. —	44	3,734	P. —	86	3,735			

235,573
235,574
235,575
235,576
235,577
235,578
235,579
235,581
235,580
235,582
235,583
235,584
235,585
235,586
235,588
235,587

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama 1
Alaska 2
American Samoa 3
Arizona 4
Arkansas 5
California 6
Canal Zone 7
Colorado 8
Connecticut 9
Delaware 10
District of Columbia 11
Florida 12
Georgia 13
Guam 14
Hawaii 15
Idaho 16
Illinois 17
Indiana 18
Iowa 19
Kansas 20
Kentucky 21
Louisiana 22
Maine 23
Maryland 24
Massachusetts 25
Michigan 26
Minnesota 27
Mississippi 28
Missouri 29
Montana 30
Nebraska 31
Nevada 32
New Hampshire 33
New Jersey 34
New Mexico 35
New York 36
North Carolina 37
North Dakota 38
Ohio 39
Oklahoma 40
Oregon 41
Pennsylvania 42
Puerto Rico 43
Rhode Island 44
South Carolina 45
South Dakota 46
Tennessee 47
Texas 48
Utah 49
Vermont 50
Virginia 51
Virgin Islands 52
Washington 53
West Virginia 54
Wisconsin 55
Wyoming 56
U.S. Air Force 57
U.S. Army 58
U.S. Navy 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,890,879
3,890,968
3,891,181
3,891,393
3,891,553
3,891,941
3 : 3,890,731
4 : 3,890,657
3,890,666
3,890,698
3,890,970
3,890,982
3,891,043
3,891,394
3,891,479
3,891,585
3,891,874
6 : 3,890,649
3,890,655
3,890,656
3,890,662
3,890,684
3,890,699
3,890,706
3,890,722
3,890,737
3,890,795
3,890,813
3,890,815
3,890,831
3,890,840
3,890,859
3,890,865
3,890,871
3,890,874
3,890,875
3,890,877
3,890,887
3,890,891
3,890,897
3,890,901
3,890,904
3,890,932
3,890,934
3,890,939
3,890,951
3,890,957
3,890,963
3,890,969
3,890,973
3,890,978
3,890,984
3,890,993
3,890,999
3,891,002
3,891,004
3,891,033
3,891,035
3,891,037
3,891,046
3,891,048
3,891,063
3,891,093
3,891,102
3,891,130
3,891,144
3,891,160
3,891,162
3,891,190
3,891,217
3,891,220
3,891,227
3,891,233
3,891,235
3,891,240
3,891,247
3,891,255
3,891,262
3,891,265
3,891,282
3,891,285
3,891,291
3,891,308
3,891,313
3,891,317
3,891,328
3,891,343
3,891,356
3,891,373
3,891,377
3,891,400
3,891,424
3,891,452
3,891,458
3,891,467
3,891,482
3,891,488
3,891,489
3,891,490
3,891,515
3,891,528
3,891,533
3,891,538
3,891,547
3,891,555
3,891,556
3,891,559
3,891,560
3,891,569
3,891,583
3,891,662
3,891,677
3,891,680
3,891,682
3,891,688
3,891,712
3,891,714
3,891,743
3,891,760
3,891,766
3,891,773
3,891,775
3,891,797
3,891,822
3,891,830
3,891,839
3,891,840
3,891,859
3,891,882
3,891,900
3,891,906
3,891,910
3,891,924
3,891,925
3,891,928
3,891,936
3,891,943
3,891,950
3,891,956
3,891,967
3,891,977
3,891,984
8 : 3,891,014
3,891,412
3,891,546
3,891,567
3,891,744
3,891,972
3,891,973
9 : 3,890,682
3,890,704
3,890,751
3,890,010
3,891,015
3,891,171
3,891,294
3,891,330
3,891,378
3,891,627
3,891,637
3,891,698
3,891,750
10 : 3,890,667
3,890,761
3,891,158
3,891,582
3,891,604
3,891,606
3,891,609
11 : 3,891,817
12 : 3,890,659
3,890,827
3,890,867
3,890,909
3,890,922
3,890,948
3,891,057
3,891,108
3,891,188
3,891,230
3,891,249
3,891,314
3,891,347
3,891,359
3,891,612
3,891,706
3,891,871
3,891,899
3,891,964
13 : 3,891,097
3,891,173
3,891,210
3,891,580
3,891,955
15 : 3,890,929
3,891,139
16 : 3,890,705
17 : 3,890,648
3,890,651
3,890,675
3,890,687
3,890,715
3,890,726
3,890,728
3,890,744
3,890,777
3,890,788
3,890,829
3,890,847
3,890,884
3,890,912
3,890,936
3,890,967
3,890,972
3,890,976
3,891,071
3,891,073
3,891,101
3,891,113
3,891,116
3,891,128
3,891,135
3,891,146
3,891,176
3,891,207
3,891,256
3,891,267
3,891,296
3,891,331
3,891,371
3,891,397
3,891,401
3,891,403
3,891,416
3,891,453
3,891,461
3,891,491
3,891,492
3,891,497
3,891,527
3,891,535
3,891,545
3,891,568
3,891,630
3,891,656
3,891,687
3,891,701
3,891,717
3,891,747
3,891,755
3,891,771
3,891,804
3,891,838
18 : 3,890,719
3,890,799
3,890,846
3,890,918
3,891,042
3,891,066
3,891,072
3,891,082
3,891,110
3,891,111
3,891,137
3,891,197
3,891,231
3,891,239
3,891,349
3,891,459
3,891,601
3,891,615
3,891,653
3,891,658
3,891,703
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4	:	235,584		235,580	19	:	235,572		235,526	40	:	235,493		235,567
6	:	235,489		235,582			235,583		235,565			235,513		235,568
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		235,500		235,514			235,577		235,495	42	:	235,544	51	: 235,556
		235,503		235,554			235,586		235,523			235,546		235,557
		235,520	13	: 235,587	26	:	235,492		235,562			235,551		235,558
		235,531	17	: 235,509			235,515		235,563			235,552		235,559
		235,532		235,528	29	:	235,504		235,569			235,553		235,560
		235,533		235,574			235,534		235,575	48	:	235,522		235,561
		235,536	18	: 235,507	34	:	235,494		235,576			235,527	53	: 235,530
		235,545		235,512			235,524	37	: 235,540			235,564	55	: 235,505
		235,550		235,542			235,525		235,549			235,566		235,543
		235,555		235,581										

PLANT PATENTS

6	:	3,733		3,735	12	:	3,734				

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

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U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*